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The Magazine of Personal Multimedia

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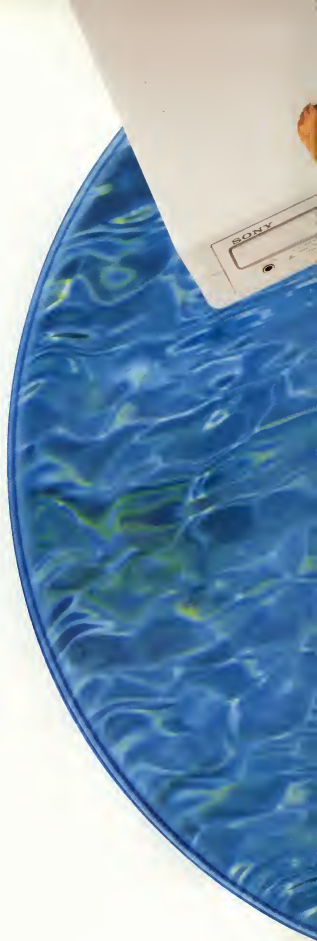
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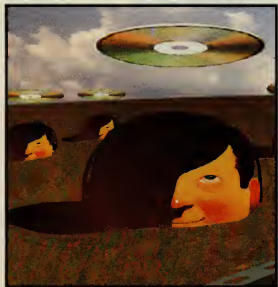
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Product Information Number 140

CD-ROM Today

The Magazine of Personal Multimedia

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FIRST WORD

CD-ROM Today
The Magazine of Personal Multimedia

JULY/SUMMER 1993

Welcome to the premiere issue of *CD-ROM Today: The Magazine of Personal Multimedia*. We're delighted to bring you a brand-new magazine that's written, edited, and designed from the ground up for you, the CD-ROM user with an active interest in multimedia computing.

Why *CD-ROM Today*? We see a need for a consumer-based magazine that offers a friendly, straightforward approach, one that delivers solid information — and one that covers the kinds of products that people use at home, in the classroom, and in small business.

As you look through the magazine, you'll notice that we've designed an editorial structure for ease of navigation and reference. We've divided our features section into topics of interest, and we've arranged our reviews section by software category. A glance at the table of contents will give you a quick overview of what we cover and how we've organized various topics across the issue.

As you are aware, *CD-ROM* and *multimedia* are two of the most banded-about terms in the personal-computer arena today. Thanks to the massive market penetration of audio CDs in the past several years, new computer users were instantly familiar — and quite comfortable — with the notion of *CD-ROM*.

Multimedia, on the other hand, is still an amorphous concept for many people. And not just consumers. We've sat through more than one industry conference where a clear and precise definition cannot be agreed upon. To

simplify matters, we'll define *multimedia* modestly and broadly as the convergence of program content, audio, and video. Of course, all of these components must be interrelated, synchronized, and governed by an intelligent interface. If the content and execution are solid, the result is effective *multimedia* software.

While we use both *CD-ROM* and *multimedia* in the name of this publication, we do want to make the point that these terms are not interchangeable. A *CD-ROM*, after all, is just a great big storage device (equivalent to approximately 450 high-density floppy diskettes), and *multimedia* is a blend of technologies that have been long in place. The connection is simply that *CD-ROM* is currently the optimal storage medium for accommodating the various byte-hungry components of *multimedia*.

Our goal with *CD-ROM Today: The Magazine of Personal Multimedia* is to provide you with information you can use: what hardware and software products are available, what's on the way, what's significant in terms of trends and technology, and — last, but certainly not least — to give you our collective opinion on individual products.

Regardless of your area of computing interest, it's an exciting time. We're looking forward to the ride.



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What is the wo

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Next is our interactive movie guide, Cinemania. It's sure to give you new-found insight into your favorite films.

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To Caddy or Not To Caddy

Which are better, caddyless CD-ROM drives or the ones that use caddies?

David Moncrief
Lake Worth, Florida

There are advantages and disadvantages to each style. CD-ROM drives that use caddies (special cases that hold a disc when it's inserted in the drive) allow for quicker changing of discs, provided you have enough caddies to hold all the discs you want to use on a regular basis. They can also help to protect your discs, since they'll likely remain in their caddies rather than floating around loose on your desk.

If you use a lot of different discs, having a caddy for each can be a bit expensive, and swapping CDs in and out of the caddies all the time cancels any advantage of convenience. Caddyless drives are probably handier if you have and use more than a few discs. We suspect that they'll become more popular for personal use.

CD-ROM Recording: Rolling Your Own

I love having a CD-ROM drive on my computer, but I'd like to be able to make my own CD-ROMs. I've seen magazine ads for recordable optical disc drives. Could I use one of these to record CD-ROMs?

Bret Smalley
Santa Monica, California

There are two kinds of optical disc recorders around now. Magneto-optical drives have lingered in the market for several years, and they can read, write, and

erase data on their discs.

Unfortunately, our CD-ROM drives can't read their discs, so they're obviously not a good medium for exchanging data with the general public. And since Magneto-optical drives are still in the \$2000-3000 range, they aren't likely to catch on with the average user any time soon.

In the last year, the price of real CD-ROM recorders has dropped dramatically, with complete systems (hardware and mastering software) available from several manufacturers for under \$10,000. That's still a lot of cash for most folks, but when you consider that CDs were designed to be pressed like phonograph records, it's amazing that recorders exist at all. Many corporations have started using these CD recorders to archive and distribute their data, and service bureaus can put data on a CD for you if you can't justify buying a recorder — for a cost of about \$150-\$200 per disc.

There's one big catch, though (besides the price, that is): You can write on a blank recordable CD, but you can't erase it. It's what's known as a write-once medium, sometimes abbreviated as CD-WO. This is an inevitable consequence of being compatible with CD-ROM readers.

Expect these prices to drop further. Kodak's PhotoCD format uses CD-WO recorders to store photographs on a CD-ROM. If PhotoCD really catches on, every one-hour photo shop and department store photo counter will feature a CD-ROM recorder, and the technology will become much more accessible to consumers and considerably less expensive.

Fast Enough?

I was just reading through the manual for my new CD-ROM drive and noticed something curious. It's advertised as a high-performance drive, with a seek time of 350ms, but the manual says that this is the "1/3 stroke" seek time. The "full stroke" seek time is listed at 650ms, which is a lot slower. Did I get taken or what?

M.T. Chirock
Oscoquan, Virginia

No, your drive is just fine. The 1/3 stroke measurement is a standard in the industry and is usually the figure you see when a drive's seek time is quoted. (Seek time tells how long it takes the drive to move its playback head from one track on the disc to another — an important measure of the performance of a CD-ROM drive.)

In case you're wondering about the significance of one-third of the stroke, the average distance between two random points on the disc is one third of the distance between the inner and outer tracks. So, in theory, a drive seek operation will, on average, cover about one-third the total travel of the head. In practice, seeks are typically even shorter than this for several reasons, one being that discs are rarely completely filled with data.

INTERACT!

Have a question? Comment? Write to:

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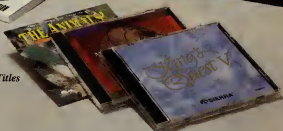
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Megamedia delivers to your front door everything you need to get up and rolling in multimedia — world class hardware and software — in one complete package for quick installation and lasting performance.

Reliable name brand components include the world's fastest CD-ROM drive from Toshiba. The Toshiba XM-3401 features a 200ms access speed (100 to 200% faster than other drives), 330KB data transfer rate, and is Photo CD Multisession and XA ready.

You also get amazingly clear CD quality sound reproduction capabilities with MediaVision's Pro Audio Spectrum 16 sound card. This 16-bit stereo sound card lets you mix and record from CD-audio, microphone and stereo line-in jacks.

And starter CD software titles for the entire family include King's Quest V, San Diego Zoo's — The Animals, and the Mayo Clinic Family Health Book.

Best yet, your investment in multimedia is secure with a 30-day money-back guarantee, 1-year parts and labor warranty, and lifetime toll-free technical support.

486-662DLM Medium Tower \$3895

Here's the perfect 486-66DX2 multimedia computer for the power user who demands world class performance and convenience.

Loaded with name brand components and software, this powerhouse comes with the software pre-loaded on the hard disk for plug-and-play convenience. Power features include a 244MB hard drive, 8MB RAM, 14.4 internal modem/fax, 12 CD software titles, and more.

486-33DE Mini-desktop \$1995

Step up into the exciting world of multimedia with Megamedia's newest MPC-approved computer — complete with stereo speakers, microphone, and CD software.

Designed for the newcomer to multimedia computing, this 486-33DX ensures outstanding performance with a 120MB hard drive, 14" VGA monitor, 5 CD titles, and more.

Megamedia CD Kit \$479

- Toshiba XM-3401B internal CD-ROM drive
- Trantor T-130B SCSI controller
- CD caddy and SCSI cable
- Software: San Diego Zoo — The Animals.

Call for prices on additional CD software titles, audio speakers, TEXEL CD upgrade kits, and multimedia computer systems.



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Product Information Number 124



Beatles and USA Today from Compton's NewMedia

The addresses and phone numbers for all manufacturers, publishers, and developers mentioned in NewsLine are located in the Source Directory, found on page 110.

Science for Kids

Forces & Motion, a Macintosh-based CD-ROM physical-science program for grades 3-5 is now available from Science for Kids. Bundled with a 20-page student science journal, a 48-page teacher's manual, a spring scale, magnet, and kite, Forces & Motion is priced at \$329. The interactive lessons on the CD-ROM can be selected in English or Spanish, and school licensing rights are included.

Forces & Motion is the second science program from Science for Kids, which launched its first product, "Cell"ebration, in August 1992. The debut CD-ROM is targeted to grades K-3 and introduces the concept of the cell as the fundamental construct of life. Simple Machines, the third release from Science for Kids, is targeted to grades 4-6, and is slated for an October release date.

The Compleat Beatles, a two-disc set for both Mac and MPC that includes the two-hour film from the '80s, is scheduled for release shortly. The package also features a database of information built on the book of the same name and a "rockumentary" that traces the Beatles from their early days as The Quarrymen to their breakup. The Compleat Beatles includes edited versions of 66 Beatles' songs, and provides seven

paths (e.g., Profiles, Songs, Album and Film Timeline) for exploring the discs. Suggested retail price is \$99.95.



USA Today: The '90s, Volume 1 contains more than 100,000 USA Today news

stories from January 1990 to August 1992. The program includes text, graphics, photos, and audio (courtesy of CNN) organized by sections — News, Money, Sports, and Life — as in the popular newspaper. A dictionary and world atlas are integrated into the program to help users. Printing and exporting capabilities are also included. Suggested retail price is \$69.95.

Apple Power

At the spring Intermedia show, Apple Computer announced the PowerCD, a portable machine that plays CD-ROM, Photo CD, and audio discs. The PowerCD hooks up to a desktop Macin-



Apple's new PowerCD

tosh or PowerBook via a built-in SCSI port, and connects to a TV for viewing images stored on single-session or multisession Kodak Photo CD discs. A remote control is included for manipulating Photo CD images. It also connects to stereo systems and

receives headphones for audio listening. The PowerCD should be available this summer.

Also debuting at Intermedia were the AppleDesign Powered Speakers, designed specifically for



AppleDesign Powered Speakers

computer use and multimedia applications. A volume control, on/off switch, balance control, and headphone jack are located on the front panel of each speaker. The AppleDesign Powered Speakers carry a suggested retail price of \$179 per pair, and are currently available.

Low-Cost Frame Grabber

Digital Vision has begun shipping a \$399.95 monochrome video frame grabber for PCs. The ComputerEyes/RT Monochrome allows for capture of high-quality gray-scale images from any standard video source, such as a camcorder, video camera, or VCR.



ComputerEyes/RT Monochrome
Frame Grabber

Minimum hardware requirements are a PC XT with 640K and VGA display. The RT Monochrome comes with DOS and Windows software, and supports TIF, PCX, TGA, GIF, BMP, JPEG, and other graphics formats.

New Titles from Warner New Media

How Computers Work, a new CD-ROM title based on the Time-Life *Understanding Computers and How Things Work* book series, is now available. The program offers a



Creation Stories

guided tour inside a computer system, and covers storage, input/output, the CPU, programming, and the history of personal computing. *How Computers Work* is available for the Mac with a suggested retail price of \$79.99.

Creation Stories presents the history of creation legends

and myths from nearly 60 different cultures. The disc features 12 illustrated stories with narration, and 81 stories in illustrated text. This MPC title (a Mac version is in development) is

currently available with a \$49.99 suggested retail price.

Also new is an MPC version of *Sports Illustrated Sports Almanac*, a compilation of photos, stats, and essays with narration from the pages of *Sports Illustrated*. The Mac version was released in 1992.

A MULTIMEDIA MEDICAL ADVENTURE

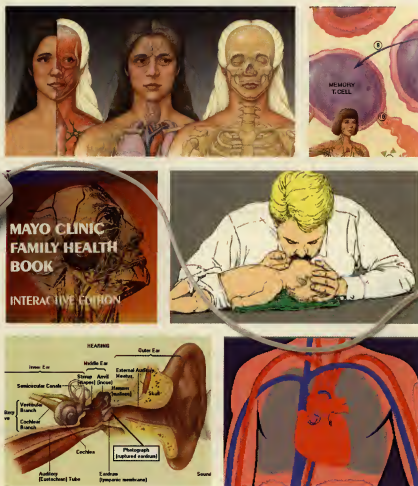
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Newsweek on CD-ROM

In partnership with The Software Toolworks, Newsweek has released *Newsweek Interactive*, a quarterly multimedia news magazine published on CD-ROM. Sold by subscription, *Interactive* combines text, photography, video, charts, maps, animation, sound, and voice.

The theme for the debut disc is the global environment. Subsequent issues will feature two-to-three themes, covering areas such as the arts, politics, science, and sports. Each disc also features the complete text of three months of *Newsweek* issues, as well as selected articles from *The Washington Post* and five hours of radio interviews from the weekly "Newsweek on Air" broadcast.

Newsweek Interactive began shipping in the CD-ROM XA format for the Sony MMCD. A DOS version is

expected to be ready in June. Subscriptions are available directly from *Newsweek* (1-800-634-6850).

Microsoft Announces Five Titles

At Intermedia, Microsoft unveiled five new CD-ROM titles, and announced plans to develop multimedia titles for the Mac. The first title will be *Microsoft Musical Instruments*.

On the heels of its popular *Multimedia Beethoven* CD-ROM, Microsoft is developing *Multimedia Mozart: The Disonant Quartet* and *Multimedia Stravinsky: The Rite of Spring* for MPC. Also coming for MPC are the 1993 edition of *Microsoft Bookshelf* and *Microsoft Dinosaurs*, an interactive disc that includes nearly 200 articles with photos, illustrations, narrations, and sound about the world of dinosaurs and their environment.

Tempra Line Grows

Mathematica has introduced its new *Tempra CD Maker*, a Windows-based CD-ROM mastering software system that allows users to burn in their own CD-ROMs. *CD Maker* shipped in April with a suggested retail price of \$2500. Mathematica is also bundling *CD Maker* with Philips' CDD 521 Compact Disc Recorder and four other Tempra titles (for authoring, video capture and editing, and animating) for a \$7995 suggested retail price.

Mathematica also announced that Prosonus' *MusicBytes*, a music and sound-effects library, will be bundled with both *Tempra Access* (a DOS-based CD-ROM designed for use with Kodak Photo CD images) and *Tempra Vision* (an educational CD-ROM multimedia-presentation product for children and students). The suggested retail price for *Access* is \$149, and *Vision* is at \$79.

CD-ROM Francais

HyperGlott Software has released an MPC version of its *Learn to Speak French* CD-ROM. Previously available for the Macintosh, the new \$99 title is shipping with both computer versions on one disc. *French* is structured the same way as last year's HyperGlott release, *Learn to Speak Spanish*. Also new is an MPC version of *Learn to Speak English*, previously available for the Mac. *English* carries a \$99 suggested retail price.

Each title is organized into 30 lessons covering 2-3 years of high-school level foreign language and 1-1.5 years of college-level course work.

New Multimedia Notebook

Scenario, Inc. recently began shipping its DynaVision IV/200 MultiMedia Notebook computer. The machine features an internal

Ready-to-Go Multimedia Systems

Multimedia Computer Corporation is shipping its latest MPC hardware/software bundle, the Mega 486-66DX2 Local Bus Multimedia System (model M46D2LM). Features include a medium-height tower case, 8 megs of RAM, a 256K cache RAM, TEAC 1.2- and 1.44-MB floppy drives, Quantum

244-MB hard drive, Toshiba CD-ROM (200-ms access time and 330-KB data-transfer rate), internal 14.4K-baud modem with fax, Pro Audio Spectrum 16 sound card, Orchid Local Bus Celsius 9000 SVGA adapter, 72Hz SVGA monitor, DOS 6.0, Windows 3.1, mouse, speakers, microphone, and headphones.

Software includes *Compton's Multimedia Encyclopedia*, *The San Diego Zoo Presents: The Animals!*, *AutoDesk Multimedia Explorer*, *King's Quest V*, *Chessmaster 3000*, *Mavis Beacon*, U.S. *Atlas*, *World Atlas*, *The Mayo Clinic Family Health Book*, *Barron's Profile of American Colleges*, *The 1993 Guinness*

Disc of World Records, and *Power Charts*. All software is pre-loaded onto the hard drive.

The Mega system also features multisession reading capabilities for Photo CD. Suggested list price for the system is \$3895. Other 486-based systems with different configurations are available as well from Megamedia.

Jazz History, Tiger! Tiger,! Mowgli's Brothers, California Travel

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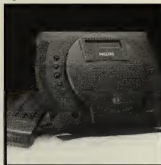
Several new titles from Ebook were announced at the spring Intermedia show. *Kaa's Hunting*, a Rudyard Kipling story and the second title in the Jungle Book CD-ROM series, marks the debut of Ebook's new development system and authoring tools. According to Ebook representatives, the biggest improvement in the new system is the coordination and timing of sound, graphics, animation, video, and sprites. *Kaa's Hunting* is currently available for MPC systems. Suggested

retail price is \$39.95.

Other new releases include *Airworks Music Library*, a \$49.95 CD-ROM collection of royalty-free music for use in multimedia programs and presentations; *A Zillion Sounds!*, a \$49.95 CD-ROM audio sound collection for both PCs and Macs; and *Ebook MacAuthor*, a \$295 multimedia authoring system for the Macintosh.

Philips Ships Double-Speed Drives

Two new double-speed SCSI CD-ROM drives have been introduced by Philips Consumer Electronics. The RapidReader drives — the CM405 ABK internal and the CM425 ABK external — feature a 265ms access time, a 300kb/second transfer rate, multisession Photo CD capability, a 64K data buffer, and SCSI-2 compliance. The CM405 carries a suggested retail price of \$599, and the CM425 is \$100 more. Both models began shipping in April.



Philips's new RapidReader external CD-ROM Drive

Time, CNN Titles

Compact Publishing, Inc. has released an updated version of its *Time Almanac* 1992 CD-ROM for MPC and Mac platforms. The disc includes 15,000 articles from 1992 issues of *Time*, video clips, and 18 CNN Newsroom video clips. Other features include news highlights by decades (beginning in 1923), presidential-election highlights from 1924, a directory of the 50 states, the Complete CIA World Factbook, and NewsQuest, a 1500-question quiz on news items from 1989-1992. The retail/consumer

edition, which includes a 32-page users' guide, has a suggested retail price of \$129.95, and the school/library edition, bundled with an 84-page research guide containing 30 lesson plans, lists for \$195.

Also new from Compact Publishing is *CNN Newsroom Global View*, a CD-ROM that uses documentary video in a narrative format to examine world affairs. *Global View* features 120 video clips, a collection of maps, articles, tables, and charts. A world atlas is included. Available now (DOS format), *Global View* has a \$99.95 SRP.

Entertainment Currents

COM Simulations has released Volume III of *Sherlock Holmes, Consulting Detective*. Available in DOS and Mac formats, the latest installment features three new cases: The Solicitor Solicitor, The Banker's Final Debt, and The Thames Murders.

- *Look for Hell Cab* from Warner New Media, a Mac-based CD-ROM adventure by artist Pepe Moreno. The game, set in New York City, offers a surreal experience — it's unlike anything else on the market. Moreno has written short stories for *Heavy Metal* magazine, and his artwork is on display at the Smithsonian and the Museum of Modern Art in Paris.

- Interplay will be releasing CD-ROM versions of several popular disk-based games. Each title has enhancements in interface, graphics, sound, and music. *The Lord of the Rings* and *Deluxe Bridge with Omar Sharif* are expected to ship shortly. *Star Trek: The 25th Anniversary* and *SimCity* are expected out late this summer. All titles will initially be available in DOS format and have a \$79.95 suggested retail price.
- A CD-ROM (DOS) version of the disk-based from Access Software will be shipping shortly.
- Activision is bringing a cult classic into the 1990s with *Return to Zork*, a DOS-based

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**Return to Zork**

CD-ROM game packed with digitized actors, plenty of speech, and puzzles galore—all in the spirit of Infocom's best-selling *Zork* text adventures from the early 1980s.

- *Screaming Metal* and *Virtual Valerie 2* are the latest CD-ROM projects from Reactor. *Screaming Metal* is being developed under the direction of Mike Saenz, creator of cult-favorite *Spaceship Warlock* and *Virtual Valerie*. Both titles will be ship later this year in a Mac format with MPC versions to follow shortly after. Also, an MPC version of *Spaceship Warlock* is due for release shortly.

**Total Distortion**

- Pop Rocket's debut CD-ROM title, *Total Distortion*, will be released shortly for the Macintosh. Described as a "rock-media theme park," the adventure game lets the player assemble music videos and TV programs while interacting with a variety of strange people. *Total Distortion* lists for \$99.

- Look for *Iron Helix*, a futuristic action-adventure game in which your job is to prevent a devastating biological weapon from reaching its target. You pilot a small robotic probe within a six-level, mazelike starship that's heavily guarded. Developed by Drew Pictures and published by Spectrum HoloByte, the *Iron*

Helix CD-ROM is available in the Mac format, with a DOS version to follow this summer.

- Several new CD-ROM titles from LucasArts will be available soon. *Day of the Tentacle: Maniac*

Mansion 2, a wacky, cartoon-like graphic adventure filled with puzzles, is due for release this summer in DOS format.

**Day of the Tentacle: Maniac Mansion 2**

Rebel Assault is a fast-and-furious 15-level action/arcade game based on the *Star Wars* movie trilogy. The first-person view at top speed must be seen to be believed. *Rebel Assault* is slated for DOS CD-ROM, Sega CD, and CD-I formats this fall. Available now is *Indiana Jones and the Fate of Atlantis*, a DOS-based CD-ROM title built on the award-

**Rebel Assault**

winning PC disk game of the same name. *Atlantis* is based on an original story line rather than one of the Indiana Jones films.

- CH Products is shipping *Virtual Pilot*, a professional-quality flight yoke designed for flight-simulation fans. It features a desktop mount and plugs into the joystick port of a

PC. *Virtual Pilot* includes a throttle, tactile fire buttons, aileron and elevator trim controls. It carries a suggested

retail price of \$149.95.

- *Mario Is Missing*, an educational game based on the exploits of the popular Nintendo character, will be released on CD-ROM (DOS) in

July by The Software Toolworks. The game teaches global geography, develops deductive reasoning, and enhances map-reading skills.

- *Dr. T's Sing-A-Long* was recently released in both Windows disk format and on CD-ROM. The program, from Dr. T's Music Software, is designed for ages 4-10, and combines music, animation, song lyrics, and musical notation. Each song has its own story line and unique cast of characters. More than 25 classic children's songs are featured.

- Revell-Monogram is taking its modeling kits to a new arena with the CD-ROM launch of *European Racers*. Shipping in June, this title is the first in the company's Power Modeler series, which combines model building and driving simulations. The products in the series employ 3-D polygon animation and graphics, as well as video and digitally recorded sound. Follow-up titles include *Hi-Tech Aircraft* and *Muscle Cars*.

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Notes of Interest

In late April, Motorola announced a new micro-processor called the PowerPC. The result of a Motorola alliance with IBM and Apple, the chip is expected to be priced at less than half of Intel's Pentium. The PowerPC will be available in 50- and 60-MHz versions, and, according to Motorola, will have the approximate computing power of the Pentium. Compatibility issues were not discussed.

- **Syracuse Language Systems** garnered two Invision 1993 Multimedia Awards for its *Playing with Language CD-ROM* series. The awards were given at the spring Intermedia show. *Playing with Language*, available in five languages for MPC and VIS, uses games and stories — rather than translations — to teach foreign language. *Introductory Games and Goldilocks & the Three Bears* are the first two titles in the series.

- **World Library** has combined its *Greatest Books Collection* and *Electronic Home Library* CD-ROMs into one disc, priced at \$49.95. Running under DOS or Windows, the disc includes the complete works of Shakespeare, the Bible, Koran, Book of Mormon, Bhagavad Gita, Life and Teachings of Buddha, the complete Sherlock Holmes, Don Quixote, and hundreds more. Also planned is a \$49.95 CD-ROM that features the text from 171

murder and mystery literary classics by Poe, Stoker, Doyle, Wells, and others.

Also new from World Library is a \$49.95 CD-ROM (DOS and Windows versions are on the same disc) containing the complete *Barron's Book Notes* of 101 classic works of literature.

- **New upgrades** (MPC format) from **The Software Toolworks** include version 4 of *U.S. Atlas* and *World Atlas*. The *World Atlas* upgrade is available now, and *U.S. Atlas* will ship in July. Version 3 of *U.S. Atlas* for the Mac will ship in June.

- For a different kind of CD-ROM atlas, check out *Small Blue Planet: The Electronic Satellite Atlas* from **Now What Software**.

Available for the Mac, with a \$159 suggested retail price (MPC version due in September), *Planet* features three map modules — Global Relief Map, USA Relief Map, and World Political Map — which can be used simultaneously for a synchronous effect. The latter was updated in March to include the recently formed countries of Slovakia, The Czech Republic, and Macedonia. Digitized photos are used throughout, and a zoom-in feature (available for larger metropolitan areas) allows you to see even the shadow of the Golden Gate bridge in San Francisco.

- *Wines of the World*, an

interactive reference tool covering the history of wine, growing regions, wine making, tasting, ranking, pricing, and more, is the first title from **Multicom Publishing**. *Wines* will be available this summer in MPC, Sony MMCD, and VIS formats.

- **Technology Integrated Products** is now shipping three Photo CD upgrade kits under the MultiPro name. The Starter Kit includes a Kodak Photo CD-compatible (multisession) internal CD-ROM drive (150KB per second transfer rate and 350ms seek time), interface card, Kodak Photo CD Access and Sampler CD for Windows, and a disposable 35mm camera with 20 exposures. Suggested retail price is \$499. The Upgrade Kit (\$699) and the Advanced Kit (\$1050) each include the CD-ROM drive and other titles bundled with the Starter Kit, but add a greater variety of software and more hardware.

- **Look for 7 Natural Wonders of the World** (Vol. 2 of the Great Wonders series), *Journey to the Heart of Japan*, *Astonishing Asia*, and *More Astonishing Asia* from **InterOptica**. *7 Natural Wonders* focuses on the Amazon rain forest, the blue whale, the Grand Canyon, the Great Barrier Reef, the Indian monsoon, Mt. Everest, and the Wildebeest migration in East Africa. Mac versions of each title are now shipping, and MPC versions

will follow in mid-summer.

- **Picture Atlas of the World**, an interactive, DOS-based CD-ROM atlas covering countries and cities of the world, is now available from **The National Geographic Society**. The disc includes more than 800 maps, 1200 photographs, 50 video clips, music from 50 countries, phrases in 105 languages, pop-up glossaries and essays, transportation and tourism information, and more. The cost is \$149.95 retail, and \$99 for educational institutions.

The latest additions to National Geographic's "Wonders of Learning" library series for Macintosh computers are now available. *The Human Body*, *A World of Plants*, and *Animals and How They Grow* round out the five-title series designed for preschoolers through second-graders. The first two titles, *A World of Animals* and *Our Earth*, were made available in the fall of 1992. The Wonders library, produced by National Geographic in conjunction with Discis Knowledge Resarch, sells for \$395.

Individual titles are priced at \$89.95. Each unit includes an activity guide, posters, and booklets.

- **Bureau Development, Inc.** will ship *The Complete Twain* on June 1. The \$39.95 CD-ROM (DOS format) contains more than 300 works, narrations of Twain's most

famous passages, and period music. The disc also features hundreds of drawings, and ten video clips, including one of Twain a year before his death.

Also slated for a June 1 release is *Multimedia World History*, a \$79.95 CD-ROM (DOS) compendium including text, photographs, illustrations, maps, video, and animation. Text sources include *Civilization: Past and Present*, *The Decline and Fall of the Roman Empire*, *Plato's Republic*, and *The Discovery of America*.

- *Adventures*, an interactive travel title from Deep River Publishing that explores adventure vacations and unusual travel experiences, is now shipping in MPC format.

Also newly released is *Fractal Ecstasy*, a resource disc with thousands of original fractal images, fly-through fractal landscapes, and a fractal creation program. Both packages have a \$79.95 suggested retail price.

- *The Consumer Information Disc* from Quanta Press is now available for DOS-based PCs and Macs at a suggested retail price of \$49.95. The disc features a large array of books, manuals, pamphlets, fact sheets, and other information publications from the U.S. government's Consumer Information Center in Pueblo, Colorado.
- Interested in testing or troubleshooting your MPC

system? *DiagSoft's* latest version of *QAPLUS* adds an array of new features for Windows and CD-ROM users. *QAPLUS/WIN 5.1* includes sector pattern tests for CD-ROM devices, expanded memory and standard memory tests, video tests, and printer tests. Dozens of other features and tools for system diagnostics are included. *QAPLUS/WIN 5.1* carries a suggested retail price of \$159.95, with significant price cuts for those upgrading from earlier versions.

- *Video Movie Guide 1993* from Advanced Multimedia Solutions recently shipped to more than 4700 Radio Shack outlets. Available in both

MPC and VIS formats (\$34.95 srp) it offers nearly 13,000 movie reviews.

- Knowledge Media now has available two new CD-ROM collections: *Resource Library Disc 1: Graphics*, a compilation of 16,000 public-domain, shareware, and freeware graphics applications; and *Resource Library Disc 2: Audio*, which includes several hundred sound and music applications. Both discs, which include source code for many of the programs, support DOS, Windows, Mac, Amiga, Atari, NeXT, SGI, Sun, and UNIX platforms, and can be purchased for \$24.95 directly from Knowledge Media.

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
Many of the CD-ROM products reviewed in this premiere issue feature software video clips — digitized movies that run in an on-screen window of your computer. Being able to play real video synchronized with an audio track is one of the most exciting developments in multimedia technology.

Software video has all the makings of a breakthrough, but don't throw away your videotapes yet. No matter how amazing the current technology, it still has serious limitations. The main problem is that, in plain terms, it just doesn't look that great. The video clips play in a window of approximately 200 x 150 pixels, something like three inches wide on most screens, and that's mighty small compared to any TV. Also, the image in the window changes only about 15 times per second, so movement does not appear to be very smooth. In comparison, motion pictures have a rate of 24 frames per second, while TVs and VCRs run at 30 frames per second. At this point, software video is good enough for many interesting uses, but it's a long way from the quality of video most of us are accustomed to seeing on an everyday basis.

QuickTime vs. Video for Windows

The technology that makes software video possible is a recent development. Apple started the ball rolling by unveiling QuickTime 1.0 for the Macintosh in the spring of 1992. By year's end, Microsoft had replied with Video for Windows, a package for PCs with quality comparable to QuickTime. About the same time, Apple released QuickTime for Windows, as well as QuickTime 1.5, an enhancement of the original Mac package.

Although Microsoft and Apple appear to be battling for the leadership position for the software video standard, it's been a pretty quiet war so far. QuickTime enjoys uncontested dominance on the Mac, the platform of choice for most multimedia developers. Reportedly, even Microsoft uses Macintosh computers to develop its CD-ROM titles. Meanwhile, the PC world seems to have settled on Video for Windows. Its nominal competitor, QuickTime for Windows, hasn't shown much life yet,



partly because Apple hasn't provided any way to record a QuickTime movie on a PC; you need a Mac for that, since QuickTime for Windows can only play back movies.

Yet there are a couple of reasons not to count out QuickTime for Windows so soon. One reason is that most developers believe that QuickTime 1.5 is technically stronger than Video for Windows. Apple pioneered the software video field, while Microsoft has seemed content just to match most of QuickTime's features, rather than innovating.

The other reason concerns the retailing of CD-ROMs. Software dealers are forced to carry several versions of a program to accommodate the various hardware platforms of their customers. But CD-ROM publishers are looking for wider distribution channels, including bookstores and CD music stores. If publishers can produce a single disc that runs on both Macs and PCs, they stand a much better chance of winning precious shelf space in these stores.


It's quite possible to put two viewer programs on the same disc, one for PCs and the other Macs, since these don't take up much storage space by CD-ROM standards. At this point, only QuickTime offers the potential for playing the same video clips on both platforms.

The Bigger Issue: Compression

Conceptually, the differences between QuickTime and VFW are minor. Both systems have three main components: a format for time-based multimedia files (i.e., "movies"), an *Application Programming Interface (API)*, and several video data-compression algorithms.

The data for software video is stored in an ordinary file, just like any other computer data. Both QuickTime and VFW define a file type for movies — QuickTime uses *MooV*, and VFW uses *AVI (Audio Video Interleaved)*. As you'd expect, neither system can read the other's files.

Any program that displays digital video must perform certain operations, including reading the movie file, decompressing the data, and copying it to the screen at the correct time. This adds up to a lot of program-



ming, and few developers would bother with it if they had to code all these operations from scratch. Video APIs make the job easier, providing a library of subroutines to do all the common operations. The APIs of QuickTime and VFW have nearly the same functionality, but each uses a different set of operations. As a result, developers must use the API that matches the file format they've chosen.

While the file formats and APIs of both systems are well established, video data compression is still the real technology issue. Besides being essential for fitting full-motion video on a CD-ROM, video-data compression is a vitally important technology for video conferencing, and for the upcoming high-definition television (HDTV) and mega-channel cable TV systems.

Both VFW and QuickTime support multiple compressor/decompressors, commonly called "codecs," where each codec has different performance characteristics. Choosing a codec involves trade-offs between file size, video quality, and the CPU power required to process each frame of the movie. The base codec in VFW is Microsoft Video 1, while QuickTime offers Apple Video Compression. Both of these provide similar performance, offering up to 180 x 120 pixel images at 15 frames per second, and at relatively low CPU loads.

Two other popular codecs have been developed by independent companies and are available for either QuickTime or VFW. Intel's Indeo codec allows video performance to be scaled according to the power of the system playing back the image. The best results come from systems equipped with Intel's i750 video processor chip. The best pure-software compression performance seems to come from SuperMac's Cinepak codec, formerly known as "Compact Video." Apple includes Cinepak as part of QuickTime 1.5, and a VFW version is also available. Unfortunately, Microsoft has chosen not to license it as part of the VFW release, so this codec is available only with

SuperMac's Video Spigot for Windows board, distributed by Creative Labs.

Another compression standard, MPEG, has been getting a lot of attention lately. Named for the Motion Picture Experts Group of the International Standards Organization (ISO), it promises much higher image quality than existing software codecs, though still not quite up to what videocassettes deliver. But MPEG's processing requirements are also much higher — high enough to require a dedicated chip to perform the decompression.

Philips recently announced a Full-Motion Video adapter for its CD-I Imagination Machine, incorporating a CL450 MPEG processor from Compression Labs.

MPEG chips have also been announced by AT&T and Integrated Information Technologies. The first-generation MPEG chips are fairly pricey, but costs will drop as hardware codecs become more common.

While the file formats and APIs of both QuickTime and VFW are well established, video data compression is the real technology issue.

What You Need, What You Don't

Both Apple and Microsoft offer retail versions of their software video packages, but you probably don't need to buy them. Any CD-ROM title that uses VFW or QuickTime includes a playback-only version of the software on the disc. When you run the program for the first time, it looks for the playback (or viewer) software on your system, and if it's not there, the program installs it.

If you want to record your own video clips, you'll need the complete package, which includes the tools for capturing and editing video. But you'll also need to add a video-capture board, such as Creative Labs' Video Blaster or SuperMac's Video Spigot, to read the video signals from a VCR or camcorder. If you decide to buy a capture board, you'll probably find that it comes with all the software you need.



First Things First

When the original IBM PC was designed in the late 1970s, the conventional wisdom held that real computers didn't "do" sound. Real computers ran business software after all, and their strength was in math, not music (forget for a moment the inextricable link between the two). The only real microcomputer on the market at that time, the Apple II, boasted an important business application called *Visicalc* (the first spreadsheet), and it certainly didn't need sound. Then came those game-playing upstarts, the Atari 800 and the Commodore 64, but everyone knew that they weren't real computers.

A few years after the introduction of the PC, other equally (or more) powerful computers appeared, all of which incorporated sound directly into their operating systems. The Atari ST, the Commodore Amiga, and the Macintosh all had sound. The Atari ST even included MIDI ports. Significantly, two of these machines — the Amiga and the Mac — so successfully provided environments for the blending of sound, music, high-resolution graphics, and animation, that they augured an early notion of the "multimedia" concept. But among the PC faithful these weren't considered real computers, and only the Mac was able to establish itself among the corporate purchasers. To this day, the ST and the Amiga are regarded as being high-end toys, and their sound-and-music sophistication helped solidify this unfortunate impression.

PC Sound Is Born

In the late 1980s, a small Quebec company introduced a product that would begin to change all of this. The Ad Lib board was an expansion card you installed inside IBM and compatible computers. Instantly, the ugly beeps and the even uglier tone-generator "music" that came from your PC became sound you could actually live with. Computer game developers adopted the board immediately, and Ad Lib became the first PC standard for sound. Even today, Ad Lib compatibility is often the first item noted on the box of many PC entertainment and education packages. Predictably, though, business applications stayed away from the

whole idea, because (as everyone knew) real users didn't need sound.


Not long after the Ad Lib board caught on, Creative Labs introduced the Sound Blaster. This card featured a variety of enhancements, and could play sound designed for the Ad Lib board as well. The Sound Blaster went through a number of changes in a short while, but eventually established a standard of its own. Today, Sound Blaster compatibility is crucial for all new sound boards, and even Microsoft, who likes to set standards rather than adopt them, is considering adding Sound Blaster compatibility to its own sound board.

Electronic music giant Roland took a different approach. Its goal was to provide PCs with full MIDI capability, and for a company that specialized in synthesizers and other electronic instruments, this made a great deal of sense. But Roland's original MT-32 was too expensive for most consumers, and the subsequent LAPC-1 card produced great music but few sound effects. Roland quickly became the sound-card choice for the serious PC musician, or for anyone with the inclination and the cash to use a Roland card for music and a Sound Blaster card for sound.

The introduction of Windows 3.0 changed PC sound forever. Almost shockingly, Windows 3.0 not only allowed sound, it encouraged it. Sound was further enhanced with Windows 3.1, and as users began to see the value of multimedia, the use of CD-ROM increased as well. Developers, publishers, and consumers quickly made the connection between effective multimedia and the audio quality and storage capacity of CD-ROM.

Suddenly, the sound board market exploded. Ad Lib fell out of the picture for a time, but re-emerged under new ownership last fall with the Ad Lib Gold. Creative Labs developed the Sound Blaster Pro and, more recently, the Sound Blaster 16, both of which feature a built-in port for a CD-ROM drive. Media Vision, a serious competitor, enhanced its Pro Audio Spectrum for Windows compatibility, then released the Pro Audio Spectrum 16 to further increase sound quality. Multimedia upgrade kits, consisting of a CD-ROM drive, a sound card, and software, appeared from both companies, and





CD-ROM manufacturers like NEC and Sony began bundling sound cards with their drives as well. Even Microsoft, who has traditionally shied away from hardware development, added a sound board to its product line, although it works only inside Windows and is not Sound Blaster compatible. Today you can find a new sound board practically every time you open the latest issue of a computer magazine.

How To Make A Choice

If you're setting out to buy a sound card, the first question is obvious: What's the difference between the cards? Price, for one thing, but that's only part of the story. The rest has to do with frequently confusing terminology like 8-bit versus 16-bit, sampling rates, number of voices, and digital-to-analog (DAC) conversion.


The back of the package for the Pro Audio Spectrum 16, for instance, contains enough strange jargon to read like a technophobe's worst nightmare, and even the more readable Advanced Gravis UltraSound box goes a long way toward scaring off a potential buyer. One of the purposes of this and future "AudioFile" columns, in fact, is to clear up some of this muck.

Your first choice is between an 8-bit or a 16-bit card. The original Ad Lib card, the Sound Blaster and Sound Blaster Pro, the Pro Audio Spectrum, and ATI's Stereo/FX-CD are all 8-bit cards. The Pro Audio Spectrum 16, the Sound Blaster 16 ASP, and the Advanced Gravis Ultra Sound are 16-bit. Actually, the Ultra Sound isn't fully 16-bit, because it can play back sounds in 16-bit but record only in 8-bit (unless you buy the upgrade). The new Ad Lib Gold 1000 is similar, but it records in 12-bit.

Simply put, 16-bit cards offer better sound than 8-bit cards. The reason has to do with the card's ability to sample sounds. Basically, the sound card receives sound

waves and converts them into numbers. This process is called analog-to-digital conversion (ADC). The challenge is to get the sound as close to the real thing (the source) as possible, and this means producing as many numbers as possible. To get the values it needs, the card analyzes the sound that's coming in and grabs as many tiny samples as it can. In effect, it freezes the sound several thousand times per second and translates what it grabs into strings of numbers that are then converted into digital values. This capturing technique is called *sampling*.

The differences in the sound quality you hear from a card depends on the capability of the card's resolution.



There's much more to choosing a sound board for your PC than simply knowing the difference between 8 bits and 16 bits.

An 8-bit sample can be assigned one of 256 separate values. Doubling the bits to 16 allows a sample to have one of 65,536 values. Precision of measurement is the idea here. When we eventually get 32-bit sound cards —

and we will in the not-too-distant future — the number of possible values will increase by another quantum leap.

The trick in deciding what you want is knowing what you want your card to do. If multimedia production is in your future, a true 16-bit card is essential. If sound and music are more casual considerations — listening with one ear as you spin a multimedia disc, for example — you may have no need for 16-bit sound.

There's much more to making a choice than simply knowing the difference between the number of bits, however. Number of voices, the interface of your CD-ROM, MIDI capabilities, and bundled software are a few of the other factors to weigh, and we'll cover them next time out. The good news for now is that the sound card market is so competitive that the inevitable consequence will be a steady increase in the quality of your computer's sound.



From Digits to Disc



TIM VICTOR

Do you need to understand the technical aspects of multimedia?

Not necessarily. But a basic grasp of how it works means you'll get more out of your system, your software, and the multimedia experience.

In one sense, explaining multimedia is like explaining how cars work, or how the human body is organized. There's enough detail to enthrall you or to bore you to death. Because of the subject's complexity, and considering the many varieties of hardware and software available, the points and illustrations in this

article should probably include qualifiers like "most" or "usually." The topic of how multimedia works is as broad as it is deep, so we'll stay with general terms and concepts; but we'll focus on key ideas, with a goal of making you a more enlightened user.

◆◆◆ On the Surface

At the most basic level, the operational principles of CD-ROM discs and audio CDs are the same. Both store content as digital data using the same encoding methods. Likewise, both are recorded on the same types of discs, and both are manufactured using the same equipment and processes.

When it comes to the

operation of the drives and the actual digital data stored on each type of disc, there are important and interesting differences between CD-ROM and CD audio. We'll get to these shortly, but first let's look at the characteristics that they share.

Physically, a compact disc is a thin layer of reflective aluminum embedded in a clear plastic disc with a diameter of 120 millimeters, which is a hair less than 4 3/4 inches. When the disc is manufactured, a pattern of bumps is pressed into the metal layer, encoding the digital data.

The data is recorded along a continuous spiral path around the CD, something like the groove on a phonograph record. Unlike a vinyl record, however, the spiral "groove" on a CD begins near the center of the disc and winds its way toward the outer edge. If this path were unwound, its total length would measure about three miles.

Also, unlike a phonograph record, reading the data on a CD doesn't involve physically

How Multimedia Works

Whatever your level of interest in CD-ROM multimedia, knowing just a few basics about the technology can change the way you look at your hardware system and make you a better judge of software. Contributing editor Tim Victor takes a magical technical tour of a few VIP concepts that will make your CD-ROM experience more valuable.

touching the surface of the medium. Instead, a CD player focuses a beam of laser light onto a point along the data track. An electronic photocell measures the brightness of the light reflected off the disc, distinguishing between microscopic low and high spots, known as "pits" and "lands," on the surface of the aluminum inside the disc. Whether the disc holds music, pictures, computer programs, or census data, it's all recorded as a series of bumps and hollows along the disc's data track.

During playback, the disc spins at a rate between 250 and 500 revolutions per minute. The player slows down the disc as the track winds toward its outer edge. This helps to achieve two conflicting goals of CD playback: reading data at a constant rate while storing as much data as possible on each disc.

Near the center, one rotation of the disc contains a relatively short section of the groove. In case your geometry is a little rusty, the length is

3.1416 (π) times the diameter of the groove at that point. The pits and lands are always recorded at the smallest size that the player's laser can resolve, so a single rotation of the disc actually yields less data near the center. To deliver data at a constant rate, the player simply spins the disc more times per second near the beginning of the CD. This keeps the *linear speed* of the disc approximately constant, between 1.2 and 1.4 meters per second.

◆◆◆ Data on Data

A compact disc can hold about 74 minutes of digital audio, 650 megabytes of computer data, or some combination of the two. This data can be divided into as many as 99 tracks. A track can be any length, though CD audio standards require a track to start and end with two seconds of silence; each track usually contains a single song. On a *mixed-mode* CD-ROM, containing a combination of audio and computer data, the first track usually holds the

computer data, followed by any number of audio tracks.

Nearly all CD-ROM drives have the ability to play CD audio tracks, converting the audio data to an analog stereo signal, which it feeds to headphones or loudspeakers through an external jack. A loudspeaker converts this

electrical signal into small but rapid variations in air pressure, i.e., sound. CD audio represents sound with two bytes of data for each stereo channel, outputting new data (*samples*) at 44,100 times per second (the *sampling rate*.) This is fast enough to represent even the highest audible frequencies.

For fans of numerology, 44,100 is significant as the square of the product of the first four prime numbers. That is, multiplying the first four primes together ($2 \times 3 \times 5 \times 7$) gives 210, and 210 squared (210×210) equals 44,100. Why this is important in CD audio isn't exactly clear, but perhaps it was chosen to allow one second of audio to be divided or subsampled in many different ways.

All CD data is stored as a series of *sectors*. A CD audio sector holds 2352 bytes of information, defining a snippet of sound that lasts $1/75$ th of a second. Since the disc is always read by sectors, this defines the limit to how precisely a position within a track can be defined.

Within a track containing computer data, each sector holds 2048 bytes of information. That's 304 bytes less data than an audio sector, the missing bytes being used for control and error-correction data. This provides some extra insurance against data loss should the drive misread part of the sector.

◆◆◆ High-Performance Driving

When a CD player plays music, it simply follows the spiral track on the rotating disc, feeding data to its audio output in the order it's written. The

player never leaves the groove, unless someone presses a button to move to another track or to somewhere else in the same track.

In contrast, a CD-ROM drive spends a lot of its time jumping between separate pieces of data stored in different places on the disc. Through interaction, the user of a CD-ROM decides what will happen next in the program, making it virtually impossible to write the data on the disc in the order that it will be read. When a drive is finding the next data item, the user usually has to wait while its optical playback head moves to the correct position. The

speed of this *seek* operation determines how long that wait will last.

Older CD-ROM drives need as much as one second to complete a typical seek operation. Now a mid-range drive often sports a rated seek time under 400 milliseconds, and the fastest drives clock in around 200 ms. This level of performance is still very slow when compared to hard drives, where seek times of 10 to 12 ms are quite common, but it still makes for a big improvement in the response of CD-ROM applications.

CD-ROM drives are designed to play 75 sectors of audio data each second, and

usually read computer data sectors at this same rate. With 2048 data bytes in a sector, the drive can send 150 kilobytes of data per second to the host. Many of the CD-ROM drives currently in use operate at this data-transfer rate.

Here, too, CD-ROM performance lags well behind that of a hard drive, which can deliver a megabyte or more of data per second. But in interactive applications, a CD-ROM's data-transfer rate usually matters less than its seek time. Applications are designed with this data transfer limit in mind, and it affects only the most data-intensive operations. It matters a great deal when you want to copy some large data files from a CD to a hard disk as quickly as possible, but isn't as much of a problem when playing sound or even full-motion video.

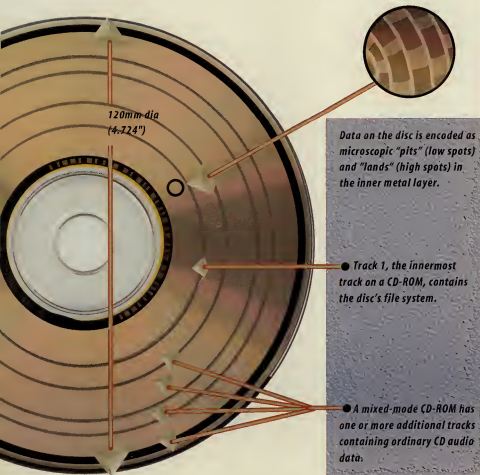
Many of the newer CD-ROM drives feature faster data rates. Models like NEC's CDR-74 and Toshiba's XM3401 are capable of *double-speed* operation. When reading computer data, they rotate the disc at twice the normal speed, delivering data at a rate of 300 KB per second. When playing audio tracks, a double-speed drive switches back to the standard speed. There's even one quad-speed drive available, a super-premium 6-disc changer from Pioneer that boasts a 600 KB per second data rate.

The extra throughput gained from the newer drives is most helpful for discs that contain large archives of data, but it also carries a higher price tag since it requires much more sophisticated drive electronics. As this technology matures—and it's maturing quickly—expect more double- and quad-speed drives, and at lower prices.

Speaking the Same Language

A CD-ROM drive is also distinguished by its hardware interface, which transports commands from the computer to the drive and also returns data and status information from the drive to the computer. The design of the hardware interface includes a set of electronic signals, along with the cables and connectors that carry them.

Interfaces fall into two distinct categories: SCSI and Other. The *Small Computer System Interface* is a well-established standard for



Data on the disc is encoded as microscopic "pits" (low spots) and "lands" (high spots) in the inner metal layer.

● Track 1, the innermost track on a CD-ROM, contains the disc's file system.

● A mixed-mode CD-ROM has one or more additional tracks containing ordinary CD audio data.

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computer peripherals, supported by most drive manufacturers. SCSI ports are often built into computers, particularly on Macs, or included in an add-in card, like many PC sound boards.

Because SCSI is a general interface standard, a CD-ROM drive can share a SCSI port with other peripherals like hard disks, tape drives, and scanners. This mix-and-match capability makes a SCSI interface quite flexible, but can also lead to subtle compatibility and configuration problems that call for some technical sophistication.

The alternative interfaces use a dedicated card to connect the drive to the computer. Each manufacturer's proprietary interface is unique in some fashion, and one maker's drive won't work with another's card. These interfaces tend to be simpler and less expensive than SCSI solutions. The interface card is usually sold with the CD-ROM drive, and the complete package is often priced lower than an equivalent SCSI drive with no interface card.

The choice of CD-ROM interface is basically a matter of price and practicality, since the hardware interface has essentially no effect on the drive's performance. Support for proprietary interfaces is pretty much limited to IBM-compatible PCs running DOS and Windows, so SCSI is the only choice for Macs. It's probably the only way to go for

PCs running alternative operating systems such as OS/2 or Unix. Proprietary adapter cards also require a free expansion slot, which rules them out for slotless laptops (SCSI adapters which connect to a laptop's parallel printer port are available).

CD-ROM File Systems

As far as a CD-ROM drive is concerned, the digital data on a disc is just a bunch of sectors, each holding a block of 2048 bytes. This is quite convenient for the drive, but not so helpful for the programmer; just about any software component on a CD-ROM — a sound effect, a picture, or whatever — will take up a lot more than 2000 bytes. Someone has to keep track of each item's location on the disc, as well as how many blocks it occupies.

A computer addresses this same problem with all of its storage media, and one of the main responsibilities of any operating system is to organize this data into files. A file system gives a name to each item of data and tracks other information for that file, like its size, its creation date, and which data blocks it occupies.

A CD-ROM can be recorded using any file system. Quite a few Mac CD-ROMs use HFS, a file system used for Mac hard drives. More often though, CD-ROMs use the ISO9600 file system, a standard format designed specifically for CD-ROM.

ISO9600 isn't native to any operating system, but most computers can understand it with appropriate driver software. In the case of PCs, a piece of software called MSCDEX.EXE manages the ISO9600 file system, associating a CD-ROM with an ordinary driver letter.

This file format is sometimes called "High Sierra," after Del Webb's High Sierra Hotel & Casino in Lake Tahoe, Nevada, where the group of industry representatives who developed ISO9600 first met. Although the format was changed slightly before its adoption by the International Standards Organization, the two names are practically synonymous now.

Sounds and Music

Computer files represent a sound's waveform as a series of samples, the same technique used by audio CDs. Each sample is a number that represents a value for the sound at some point in time. The computer's sound interface converts this value to an electrical voltage, and a loud-speaker converts that to a change in air pressure, which can be heard as sound.

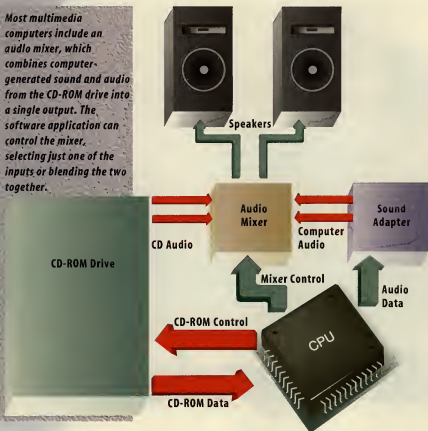
Some audio interfaces can generate sound with the same quality as CD audio, i.e., 44,100 samples per second, 16 bits per sample, in stereo; but few CD programs take advantage of that level of performance. Most discs give up some amount of quality to reduce the amount of disc space used by the samples. By using some combination of a lower sampling rate, fewer bits per sample, and mono instead of stereo, a CD-ROM can actually hold more computer sound than it can CD audio. At 11,000 samples per second and 8 bits per sample, a CD-ROM can contain more than 16 hours of monaural sound.

From Pixels to Pictures

Digital graphic images on a CD-ROM are also stored as ordinary data files. In this case, the data values in the file represent a rectangular grid of dots called *pixels*. Any picture shown on a computer screen is made of hundreds or thousands of pixels. The numeric value of each pixel determines its color.

As with audio, application designers face a

Most multimedia computers include an audio mixer, which combines computer-generated sound and audio from the CD-ROM drive into a single output. The software application can control the mixer, selecting just one of the inputs or blending the two together.



trade-off between the quality of an image and the amount of disc storage it needs. A digital image is characterized by its resolution (width and height measured in pixels) and by the number of bits used for each pixel.

A single bit of data can have only one of two values, a 0 or a 1. Likewise, a pixel represented by a single bit can have only two colors, white or black. Higher-quality images use more bits per pixel, with 4 bits allowing for 16 colors, and 8 bits per pixel giving 256 available colors.

The highest quality pictures, described as *full-color*, use 24 bits for each pixel, with 8 bits representing each of 3 color channels. A full-color pixel has red, green, and blue

components, with 256 possible levels for each. Together, they allow for over 16.7 million different colors.

One of the hottest multimedia topics is full-motion video. With systems like QuickTime and Video for Windows, programs can play video on the screen of an ordinary computer. The quality of these movies is rather limited on all but the highest-powered machines, and even then it's well below the level of VHS video tapes. But we're still early in the evolution of this technology.

Mixing It Up

Mixed-mode CD-ROMs, containing both computer data and CD audio, create one extra complication. There are

actually two sound sources in the system, one on the computer's sound adapter and the other on the CD-ROM drive itself, and it's quite common for an application to use both.

Many multimedia computers include an audio mixer, which can combine several audio sources into a single output. This allows a program to control the volume level of each source, superimposing computer-generated sounds over CD audio, and playing the result through a single set of speakers.

The sounds the computer creates are often based on a data file on the CD-ROM, but one important condition comes into play: a drive can read from only one track at a time. If the computer tries to read data from a file while an audio track is playing, the CD audio will stop immediately. Designers of mixed-mode CD-ROM applications must plan their data accesses carefully to prevent unexpected interruptions in the program's soundtrack.

A House Built on Solid Ground

Multimedia CD-ROM software can tap all the resources of the computer. The application's performance depends on many factors, including the computer's CPU power, its memory capacity, and the speed and resolution of its video display.

A well-engineered CD-ROM application is built on the same strengths as any well-engineered computer program, but there are some special considerations to keep in mind. A well-designed user interface is essential. The program's operation must be smooth, intuitive, and easy-to-learn. Many CD-ROM titles are intended for entertainment, education, or reference, and users can't be expected to suffer a confusing or frustrating interface for the sake of an otherwise useful program.

Software designers must also consider the unique characteristics of the CD-ROM medium. When programs exploit CD-ROM's unique strengths — superlative audio quality and tremendous storage capacity — and minimize its limitations, they can create a spectacular multimedia experience.



Multimedia Upgrade Kits

If you've been using computers for a while, you know how quickly hardware evolves — and you're certainly aware that the only constant in the world of personal computing is change. Just when you're convinced that your brand new 386DX/25 is the last computer you'll ever need — that its two megabytes of memory and super-sharp new VGA card will make short work of any software you install on your 80-meg drive — along comes Windows. And suddenly, you feel like you did when working with that old 286.

But now you're prepared. You're working on a 486/33 with eight megs of memory, a 200-megabyte hard drive, and a fast SVGA card. Your Windows apps fly, and you're crunching numbers like nobody's business. Your aerial-combat sims would make the Air Force proud. You're a Power User, the master of your machine.

A Buyer's Guide

Matthew A. Firme

Then Bob up the street calls you to see his new computer — an MPC system. He pops in a CD-ROM, and there on his screen you see a color *movie* and hear JFK delivering his inaugural address. He clicks his mouse a few times, and a complete article on the life and work of Beethoven appears on the screen, while a full orchestra plays *Ode to Joy* in the background. *I've done it again*, you think as you trudge back home. *Multimedia is here, and I've missed the boat.*

Fortunately, nothing could be further from the truth. A number of companies

offer kits that will quickly transform your computer into a multimedia wonder. And thanks to breakthroughs in engineering and a surge in demand, today's multimedia upgrade kits offer fast, sophisticated CD-ROM drives and remarkable sound at very reasonable prices.

The MPC Standard

MPC (for Multimedia PC) is a standard established by Microsoft, IBM, and Tandy, and refers specifically to multimedia programs run under Windows. Although there are a number of DOS-based CD-ROM products, the MPC standard is still a useful guideline in achieving a minimally workable CD-ROM system.

The MPC base standard specifies a 386SX system running Windows, with a 40-meg hard drive, a floppy drive, a joystick port, a mouse, stereo speakers, and a MIDI-compatible sound card that

can handle digitized sound. And, of course, a CD-ROM drive.

The CD-ROM drive must be able to transfer data to your CPU at no less than



The Sony Desktop Library offers a wide array of software.

150 kbps — and the higher the number, the better. This transfer rate ensures that data can be passed along at speeds sufficient to avoid jerky animation and video. Fortunately, most currently available drives comply with this standard. And the newer double-speed drives, pioneered by NEC, allow for even higher transfer rates by spinning faster when accessing program and video data, then slowing down to read musical information accurately. Using this system, average transfer rates of as high as 300 kbps can be achieved.

Another important number in comparisons of CD-ROM drive performance is access (or seek) time, which is measured in milliseconds. Access time ratings measure the average amount of time it takes for the CD-ROM drive to locate requested information on the CD itself, and in practice determine how long you'll have to wait as the drive accesses the next page in an article or loads a new video clip. A lower number is better when considering access time. Although there is no MPC standard for access time, you'll probably find that anything more than 500ms can quickly become tiresome.

Remember, though, that these requirements are the *minimum* your system needs in order to meet MPC specs; although you *can* run a multimedia

encyclopedia on a 386SX/20, you'll be a lot happier working on a 386DX/33 or better.

The Path of Least Resistance

For most users ready to take the plunge into CD-ROM, multimedia upgrade

kits provide the easiest and fastest way to do it. They include the CD-ROM drive, interface, and sound card you'll need to get up and running — and most importantly, all three are designed to work together. If you buy the components separately, you can easily run into trouble unless you've got some technical savvy.

A CD-ROM requires a special interface to communicate with your CPU. This might be a SCSI or AT Bus, or a proprietary interface. Many currently available sound cards have built-in CD-

considerations have been addressed. This frees you to make more important decisions, such as what kind of drive and sound board are best for you.

When choosing a drive, speed is your most important concern. Double-speed drives deliver the perkier performance, but they cost more. The investment is a wise one, though, if you don't want to waste a lot of time waiting for that next block of data to load. Fortunately, double-speed technology is appearing in drives from a number of companies. And as competition heats up, drive prices are sure to fall.

You'll also have to decide whether you want an internal or external CD-ROM drive. If your computer is in a desktop chassis and you have no vacant drive bays, you'll have to go with an external drive. But even if you have a tower chassis with plenty of empty bays, an external drive may be the way to go. You don't have to root around inside your computer, and you have the convenience of simply turning the drive off when you don't want to use it. This can save a lot of CONFIG.SYS and AUTOEXEC.BAT editing, because booting with the drive off



NEC offers three versions of its Multimedia Upgrade Kit.

ROM interfaces. But matching the sound-card interface with the CD-ROM drive isn't easy, unless you know the right questions to ask before you buy either.

Upgrade kits eliminate the need for such specific knowledge, as all these

will prevent the often-massive CD-ROM drivers from loading, and free up base memory you'll need to run non-CD programs.

Internal drives have advantages, too. For one thing, they take up less room,

Company	Product	CD-ROM Access Time/ Transfer Rate	Sound Board	Bundled Software	List Price
ATI Technologies	ATI Multimedia Upgrade Kit	380ms/175Kbps	Stereo F/X CD	Choice of Windows Master or Game Master CD-ROM collections	\$499
Attech Labs	Sound Galaxy Multimedia Upgrade Kit *	350ms/150Kbps	Sound Galaxy NX Pro	Choice of A: Microsoft Bookshelf, Macmillan Dictionary, and Loom, or B: Microsoft Bookshelf, Sherlock Holmes Consulting Detective II, and Sleeping Beauty	\$549 (internal), \$699 (external)
CompuAdd	Multimedia CD-ROM Upgrade Kit	380ms/150Kbps	Pro Audio Spectrum 16	Compuadd Rack	\$575 (internal), \$699 (external)
Creative Labs	Discovery CD 8 Upgrade Kit	390ms/150Kbps	Sound Blaster Pro Deluxe	The Software Toolworks/Multimedia Encyclopedia, The San Diego Zoo Presents...The Animals, and Lemmings	\$599.95 (internal) \$699.95 (external)
	Discovery CD 16 Upgrade Kit	390ms/150Kbps	Sound Blaster 16	The Software Toolworks/Multimedia Encyclopedia, The San Diego Zoo Presents...The Animals, and Lemmings	\$699.95 (internal) \$799.95 (external)
	Entertainment CD 8 Upgrade Kit	390ms/150Kbps	Sound Blaster Pro Deluxe	The Software Toolworks/Multimedia Encyclopedia, The San Diego Zoo Presents...The Animals, Where In the World Is Carmen Sandiego? Deluxe Edition, Just Grandma and Me, Sherlock Holmes Consulting Detective, The Secret of Monkey Island, Secret Weapons of the Luftwaffe, Loom	\$699.95 (internal) \$799.95 (external)
	Entertainment CD 16 Upgrade Kit	390ms/150Kbps	Sound Blaster 16	The Software Toolworks/Multimedia Encyclopedia, The San Diego Zoo Presents...The Animals, Where In the World Is Carmen Sandiego? Deluxe Edition, Just Grandma and Me, Sherlock Holmes Consulting Detective, The Secret of Monkey Island, Secret Weapons of the Luftwaffe, Loom	\$799.95 (internal) \$899.95 (external)
	Multimedia Upgrade Kit	390ms/150Kbps	Sound Blaster Pro	Windows 3.1, Microsoft Bookshelf, Microsoft Works, Macromind Action!, Authorware Star, Tempra, Sherlock Holmes Consulting Detective, and Creative Sounds	\$799.95 (internal) \$899.95 (external)
Focus Information Services	2theMax Dipera *	550ms/150Kbps	2theMax SoundMedia	Microsoft Bookshelf, Voyetra, King's Quest V	\$698
MediaResources	StudioPro CD-ROM	280ms/300Kbps	Media Resources Studio	Choice of four software bundles	\$999
	StudioPro XL CD-ROM	200ms/330Kbps	Media Resources Studio	Choice of four software bundles	\$1299
	Studio CD-ROM	550ms/150Kbps	Media Resources Studio	Choice of four software bundles	\$699
MediaSonic	Sound Commander Pro Multimedia Upgrade Kit	Choice of drives: Mitsumi 350ms/150Kbps, Sony 480ms/150Kbps	Sound Commander Pro	Choice of software bundles	\$399
Media Vision	CDPC XL	280ms/300Kbps	Pro Audio Spectrum 16	Macromind Action!, Where In the World Is Carmen Sandiego? Deluxe Edition, Compton's Multimedia Encyclopedia, Media Vision Pocket Tools	\$1495
	CDPC	340ms/150Kbps	Pro Audio Spectrum 16	Macromind Action!, Where In the World Is Carmen Sandiego? Deluxe Edition, Compton's Multimedia Encyclopedia, Media Vision Pocket Tools	\$1295
	Pro 16-Multimedia System	280ms/300Kbps	Pro Audio Spectrum 16	Lotus 123 w/Multimedia Smarthelp, Compton's Multimedia Encyclopedia, King's Quest V, Macromind Action!, Where In the World Is Carmen Sandiego? Deluxe Edition	\$1195
	Fusion CD 16 & 16E	Fusion 16E (internal) 490/150Kbps, Fusion 16E (external) 650ms/150Kbps	Pro Audio Spectrum 16	Compton's Multimedia Encyclopedia, Where In the World Is Carmen Sandiego? Deluxe Edition, Civilization, Mantle, Battleships Enhanced	\$699

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Product Information Number 130

(continued from page 32)

Company	Product	CD-ROM Access Time/ Transfer Rate	Sound Board	Bundled Software	List Price
NEC Technologies	NEC Multimedia Upgrade Kit	Choice of drives: CDR 74(external) and CDR 84 200ms/300Kbps, CDR 37(external) 450ms/150Kbps	NEC 16-bit	Windows 3.1, Asymetrix Multimedia Toolkit	CDR 73 \$1379 (external), CDR 84 \$1299 (internal), CDR 37 \$1089 (external)
Procom Technologies	Multimedia Station	550ms/150Kbps	Pro Audio Spectrum 16	Compton's Multimedia Encyclopedia, U.S. and World Atlas, Chessmaster 3000, Mavis Beacon Teaches Typing, Power Tools for Windows, Procom's Music Sampler	\$465 (internal) \$515 (external)
	Multimedia Station Pro	200ms/330Kbps	Pro Audio Spectrum 16	Compton's Multimedia Encyclopedia, U.S. and World Atlas, Chessmaster 3000, Mavis Beacon Teaches Typing, Power Tools for Windows, Procom's Music Sampler	\$995 (internal) \$1095 (external)
Sigma Designs	Winstorm Multimedia Upgrade Kit	80ms/300Kbps	Winstorm, a combined Pro Audio Spectrum 16 and Windows Accelerated SVGA card	Compton's Multimedia Encyclopedia, Kodak Photo CD Sampler, Where in the World is Carmen Sandiego? Deluxe Edition, Asymetrix Multimedia Make Your Point, Animation, MCS MusicRack, Midsoft Multimedia Music Library	\$1199
Sony	Sony Desktop Library	550ms/150Kbps	Pro Audio Spectrum 16	The New Grolier Multimedia Encyclopedia, Great Wonders of the World V. 1, 1991 Time Almanac, The Presidents: It All Started with George, Geoworks CD-ROM Manager, Kodak Photo CD Sampler	\$849.95 (Internal) \$1069.95 (external)
Sam Moon Star	"Cool" Multimedia Upgrade Kit	400ms/150Kbps	Sound Blaster Pro	Multimedia Encyclopedia, The San Diego Zoo Presents...The Animals! Reference Library, World Atlas, U.S. Atlas, The Secret of Monkey Island, Kodak Photo CD Sampler	\$599
Tandy	MP3 Upgrade Kit	375ms/153Kbps	Tandy Multimedia Audio Card	Windows 3.1, MPC Sampler, The San Diego Zoo Presents...The Animals! World Atlas, Multimedia Toolkit, Reference Library	Price To Be Announced
Turtle Beach Systems	Multisound MPC Upgrade Kit	265ms/300Kbps	Turtle Beach Multisound	Asymetrix Make Your Point, Asymetrix MediaBlitz, Wave for Windows, Band in a Box, Midsoft Sequencer, King's Quest V, Compton's Multimedia Encyclopedia, Sound Bank sound effects sampler	\$1499

allowing us clutter lovers more desk area for stacks of disks, paper, and manuals. An internal drive is less expensive, sometimes as much as \$200 less, than the same drive in an external chassis.

Sound Considerations

Your sound card needs also play a big part in deciding which upgrade kit to buy. If you do a lot of MIDI-based sound processing and need the best quality available, you'll probably want to take a look at the Turtle Beach kit. It contains the Turtle Beach Multisound, widely recognized as the best PC sound board

available.

Most users won't need the high-fidelity recording capabilities the Multisound offers. There are some outstanding cards — Creative Labs' Sound Blaster Pro, MediaVision's ProAudio Spectrum, and ATI's Stereo F/X CD — that deliver excellent-quality sound and music playback, and offer reasonable recording capabilities.

Another important sound-card consideration is the amount of time you spend with DOS-based games. Almost all PC games support the Sound Blaster — so many, in fact, that Sound Blaster

compatibility is built into most sound cards. But the way these cards approach Sound Blaster emulation varies considerably.

Some cards, such as ATI's Stereo F/X CD, are Sound Blaster compatible right out of the box. Any program requiring Sound Blaster compatibility will work with the ATI card — no questions asked.

The Pro Audio Spectrum 16, packaged with a number of upgrade kits, asks that you configure two sets of DMA and IRQ addresses — one for the ProAudio, the other for Sound Blaster emulation. This works fine most of the

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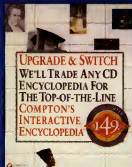
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40-10008-B



Medio Vision's CDPC kit was announced last fall. The newer version, the CDPC XL, features a faster CD-ROM drive.

Installation Tips

For some people, the idea of taking the cover off their systems and touching boards, chips, and wires is almost too much to bear. But installing an upgrade kit really isn't so bad. With a few safeguards and a careful following of instructions, the job can be done safely and correctly by just about anyone.

Before you buy an upgrade kit, be sure you have a vacant drive bay and a free 16-bit expansion slot. Your drive bays face the front of your chassis, and two will probably be occupied by your hard drive and a floppy drive. If you have an unused bay, consider an internal CD-ROM drive. If not, an external unit is your only choice.

Your expansion slots are at the rear of the chassis. A 16-bit slot will have two rectangular card receptacles, one behind the other. You'll use this slot for your sound-board/CD-ROM interface. If you're installing an external unit, you may also have to have a second free expansion slot for the external interface connector.

When you're ready to install your kit, take a few precautions. First, be sure the power supply to your computer is disconnected before you even remove the cover. Second, make certain you've dissipated any static electrical build-up before you reach into the computer or handle your new sound board. Static shocks can do real harm to component boards, including those inside your system and the sound board you're about to install. If you're working on carpet, or get frequent static shocks as you move about your home, invest in a grounded wrist strap. It wraps around your wrist and clips

to a grounded object, insuring that no static can build up.

The next step is easy: Follow the instructions that came with your kit. We found most upgrade installation manuals to be straightforward and well-written, although a few points need to be stressed.

One involves connecting the ribbon cable from your CD-ROM drive to the sound/interface board. On one side of the connector on your sound/interface board, you'll see a small number 1 or a small arrow. Make sure you attach the ribbon cable so that the number 1 (or the arrow) is on the same side as the red stripe on your ribbon cable. It might fit the other way, but it won't work!

Another tip — when installing an internal CD-ROM drive, attach the ribbon cable and audio cable before sliding the drive into the bay. Feed the cables into the bay first, carefully pulling them through and toward the expansion slot you'll use for the sound/interface card. Then, once the cables are in place, slide the drive into the bay. This way you won't risk loosening any of the interface or power connections to your hard and floppy drives as you try to connect the CD-ROM drive. It may also prove easier to attach the interface and audio cables to your sound/interface board before sliding the board into its slot.

When placing the board in the expansion slot, don't be alarmed if you have to use a good deal of force. The slots are designed to hold your card tightly, and it can take a bit of work to seat the card firmly. Be sure you've lined the edge of the card up with the slots, and then press firmly from the card's top edge, being careful not to push against any of the on-board chips or transistors. It often helps to gently "rock" the card into the slot, pressing at the back, then the front, until it snaps into place.

time, but because some programs expect the Sound Blaster to be configured in a certain way, you'll often have to change DMAs and IRQs as you move from game to game. Two sets of addresses is a little much to ask, and resolving the conflicts that often arise can be maddening.

Of course, the most hassle-free card for those doing a lot of gaming is Creative Labs' Sound Blaster Pro. If you intend to spend as much time with DOS games as you do in MPC programs, this may be the sound card to look for.

If you work almost exclusively in Windows, compatibility isn't an issue. Any sound card that includes the proper Windows drivers will work with any Windows program, including all MPC titles. This frees you to choose the card that sounds best to you, and many give the nod to the Pro Audio in this respect. (For more on sound cards, see the "AudioFile" column elsewhere in this issue.)

A Big Menu

No matter what you decide you need in a CD-ROM drive and sound card, there's an upgrade kit that's right for you. Many companies even offer choices of drives with each kit, from external or internal to standard or double-speed.

Finally, don't forget to take a close look at the software (or lack of it) bundled with the package. Much of the value of an upgrade kit is in the software, so look for titles and applications you think you'll use the most.





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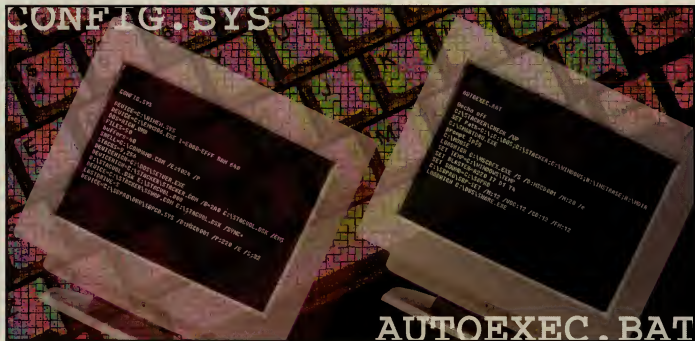
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Go Configure!

It used to be so easy. Just boot up your system, change to the right directory, run the program, and do what was necessary. No worries about device drivers, memory allocation, interrupts, or anything else — just plain, simple DOS.

Those golden years were actually brass, of course, and as technology improved, more tarnish appeared. As soon as you added a sound board to your system, your configuration worries doubled. Then, when you tossed in that extra megabyte of memory, all sorts of things started to happen. More recently, to further complicate matters, you've added a CD-ROM drive, and now you're faced with some software that won't load. With all these things happening to your system at boot-up, available memory has dropped through the floor. And if you like to play games, most of the new ones want more memory, not less.

Fortunately, DOS 5.0 supplies everything you need to manage your memory

Managing Memory with DOS

Neil Randall

effectively. If you don't have 5.0, go out and get it now. In terms of memory management or working with Windows 3.1, it's far superior to versions 4.1 or 3.3. DOS 6.0 goes a big step further towards managing your memory (see "DOS 6.0: Should You Upgrade?" sidebar), but in keeping with the current demographics of PC CD-ROM users, we'll assume that you're using 5.0.

Do the Right Boot

Memory management is a pain in the side to many users. Third-party software, such as QEMM-386 and 386Max, provides solutions

and spares a great deal of pain. But programs such as these take up hard-drive space, and they cost money. Besides, they don't really do what DOS 5.0 doesn't already let you accomplish.

To manage your system's memory, you must edit the two start-up files. When your computer starts, it searches for two files in the root directory (usually C:\). When it finds CONFIG.SYS, it executes each of the commands in the order they appear in the file. Then it searches for AUTOEXEC.BAT and performs each of its commands in sequential order. The trick to good memory management is to work smartly with these two files.

Before you do anything at all to either of these files, make a bootable floppy disk! You can do so from File Manager's Disk menu if you're in Windows, or just put a new floppy in your A: drive (not B:) and type FORMAT A: /S from the C:\ prompt. When the format is complete, reboot your computer with the

floppy in A:. If the system boots, it's safe to play with the boot-up files.

CONFIG.SYS and AUTOEXEC.BAT are ASCII files. You can edit them with any word processor that lets you save as pure ASCII (a .TXT file in Windows jargon). Or, more simply, you can make use of something else DOS provides, a nice little editor with the name of EDIT. Just type EDIT CONFIG.SYS at the C:\ prompt, and you should see the file in seconds. (Note: If this doesn't work, type DOSEDIT CONFIG.SYS instead. Or go into the DOS directory and type EDIT C:\CONFIG.SYS. To edit the other boot-up file, repeat the steps above, but replace CONFIG.SYS with AUTOEXEC.BAT.)

At this point, be sure you actually need more memory. Type MEM at the C:\ prompt and see how much RAM you have. If the reading is close to 600,000 bytes, and everything is working just fine, don't bother changing it. Few programs, even games, demand more, and most of these help you make a separate boot disk. And if you use your CD-ROM with Windows exclusively, DOS memory simply doesn't matter, since Windows essentially treats all your memory as one big chunk.

Example 1 shows a fairly typical CONFIG.SYS and AUTOEXEC.BAT. The system uses DOS 5.0 with Windows 3.1 and SmartDrive installed, and it runs a mouse driver on start-up. It also uses Creative Labs' Multimedia Upgrade Kit, which includes the SoundBlaster Pro sound board and the CD-ROM drive that comes with it. One feature is perhaps a bit more unusual. This system runs *Stacker*, the software that increases your hard-drive capacity, and *Stacker* devices feature prominently in the CONFIG.SYS file.

The memory check below the example shows that only 479,424 bytes of memory remain available after start-up. This area of memory, known as low memory, resides in the first 640K of the system's RAM. Windows loads fine, because it doesn't need

much low memory, but many DOS programs will *not* load with this little RAM available. This setup and halt — they want lots of low memory, and they want it immediately!

In Example 2, the start-up files have been revamped. So, too, has the amount of available memory. Now, we have 602,288 bytes to work with. As anyone who has wrestled with loading programs knows, these 122,864 bytes can represent the difference between night and day.

The change shown between these two examples was implemented by making use of DOS 5.0's expanded memory manager, EMM386.EXE. This allows you to load programs and device drivers into upper memory (the memory between 640K and 1 megabyte), thereby freeing up precious low (conventional) memory. The second line in the new CONFIG.SYS file shows the installation of EMM386, along with a few extra instructions. The first of these, I=E000-EFFF, lets EMM386 make use of memory reserved for video (unused in almost all systems), while the second, RAM 640, tells DOS to take 640K of the system's extended memory and turn it into expanded memory. Several games require expanded memory to run (and you may need more than 640K), and some device drivers can use it as well.

The important change, though, is in the next line, DOS=HIGH,UMB. In the first CONFIG.SYS file, DOS=HIGH lets most of DOS load itself into upper memory. By adding UMB to the line, you're telling DOS to put into upper memory any program or device driver that fits. To force a device driver into the UMB (Upper Memory Block), go into CONFIG.SYS and change its DEVICE command to a DEVICEHIGH command. Load programs into the UMB area by typing LOADHIGH at the beginning of the command line. You can do this in AUTOEXEC.BAT or from the C:\ prompt itself.

The CONFIG.SYS file in Example 2

shows two drivers loaded high: *Stacker* and *SEIVER*. Similarly, the AUTOEXEC.BAT file has two programs loaded into UMBs: the CD-ROM program MSCDEX and DOS's SHARE. (SHARE wasn't in the original AUTOEXEC.BAT; it's included here to show how much EMM386 can help.)

Two Memory Checks follow. The first is the standard check, obtained by typing MEM at the C:\ prompt. The second, a much more detailed check, results from typing MEM /C [MORE]. When you're working with EMM386 to obtain the best possible memory configuration, MEM /C [MORE] is a godsend. At every stage you can check to see precisely what's loaded into both low and upper memory, and whenever you make a change, you can try the command again.

Three items in Example 2 also make use of expanded memory itself, i.e., expanded memory above the 1 megabyte line. These are the *Stacker* driver (the /EMS switch), the *SoundBlaster Pro* CD driver (the /E switch), and the *MSCDEX* program (the /e switch). These programs either have or can load portions of themselves into expanded memory, once again freeing that all-important low memory.

A quick look at the results of the second memory check in Example 2 shows that some upper memory is still free. To make the best possible use of this memory, try changing the order of device drivers and programs. The start-up files load them in exactly the order they appear, and sometimes by altering the load order, a larger program (such as *MOUSE*) can also be placed up high. As long as you have that bootable floppy disk on hand, you can edit and re-edit to your heart's content.

A word of caution, though. If you cram upper memory too full, your mouse pointer in Windows might start jumping around a bit. If that happens, unload a driver or program or two until the pointer settles down.

AUTOEXEC.BAT

```
@echo off
C:\STACKER\CHECK /WP
SET Path=C:\DOS;C:\STACKER\C\WINDOWS;H:\INSTBASE;H:\MDIABLTZ;
C:\SMARTDRV.EXE
prompt $p$g
C:\MOUSE
C:\MSCDEX.EXE /S /D:MSCD001 /M:20 /e
SET TEMP=C:\WINDOWS\TEMP
SET BLASTER=A220 I7 D1 T4
SET SOUND=C:\SBPRO
C:\SBPRO\SBP-SET /M:12 /VC:12 /CD:12 /FM:12
```

EXAMPLE 1**CONFIG.SYS**

```
DEVICE=C:\HIMEM.SYS
DOS=HIGH
FILES=50
buffers=40
SHELL=C:\COMMAND.COM /E:1024 /P
STACKS=9,256
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\STACKER\STACKER.COM /B=240 C:\STACVOL.DSK D:\STACVOL.DSK E:\STACVOL.000
DEVICE=C:\STACKER\SSWAP.COM C:\STACVOL.DSK /SYN+
LASTDRIVE=S
DEVICE=C:\SBPRO\DRV\SBPCD.SYS /D:MSCD001 /P:220 /E:15:32
```

MEMORY CHECK

```
655360 bytes total conventional memory
655360 bytes available to MS-DOS
479424 largest executable program size
```

AUTOEXEC.BAT

```
@echo off
C:\STACKER\CHECK /WP
SET Path=C:\DOS;C:\STACKER\C\WINDOWS;H:\INSTBASE;H:\MDIABLTZ;
C:\SMARTDRV.EXE
prompt $p$g
C:\MOUSE
LOADHIGH C:\MSCDEX.EXE /S /D:MSCD001 /M:20 /e
SET TEMP=C:\WINDOWS\TEMP
SET BLASTER=A220 I7 D1 T4
SET SOUND=C:\SBPRO
C:\SBPRO\SBP-SET /M:12 /VC:12 /CD:12 /FM:12
LOADHIGH C:\DOS\SHARE.EXE
```

EXAMPLE 2**CONFIG.SYS**

```
DEVICE=C:\HIMEM.SYS
DEVICE=C:\EMM386.EXE I=E000-EFFF RAM 640
DOS=HIGH,UMB
FILES=50
buffers=40
SHELL=C:\COMMAND.COM /E:1024 /P
STACKS=9,256
DEVICEHIGH=C:\DOS\SETVER.EXE
DEVICEHIGH=C:\STACKER\STACKER.COM /B=240 C:\STACVOL.DSK /EMS D:\STACVOL.DSK E:\STACVOL.000
DEVICE=C:\STACKER\SSWAP.COM C:\STACVOL.DSK /SYN+
LASTDRIVE=S
DEVICE=C:\SBPRO\DRV\SBPCD.SYS /D:MSCD001 /P:220 /E:15:32
```

MEMORY CHECK 1

```
C:\>mem
```

```
655360 bytes total conventional memory
655360 bytes available to MS-DOS
594144 largest executable program size
1048576 bytes total EMS memory
1048576 bytes free EMS memory
7340032 bytes total contiguous extended memory
0 bytes available contiguous extended memory
1048576 bytes available XMS memory
    MS-DOS resident in High Memory Area
```

MEMORY CHECK 2**Conventional Memory:**

Name	Size in Decimal	Size in Hex
MSDOS	17856 (17.4K)	45C0
HIMEM	1072 (1.0K)	430
EMM386	3232 (3.2K)	CA0
SBPCD	10000 (9.8K)	2710
COMMAND	3392 (3.3K)	D40
MOUSE	17072 (16.7K)	42B0
FREE	64 (0.1K)	40
FREE	128 (0.1K)	80
FREE	602288 (588.2K)	93080
Total FREE:	602288 (580.4K)	

EXAMPLE 2 (continued from previous page)

Upper Memory:

Name	Size in Decimal	Size in Hex
SYSTEM	241232 (235.6K)	3AE50
SMARTDRV	28304 (27.6K)	6E90
SETVER	400 (0.4K)	190
STACKER	20768 (20.3K)	5120
MSCDEX	16320 (15.9K)	3FC0
SHARE	6192 (6.0K)	1830
FREE	32 (0.0K)	20
FREE	4432 (4.3K)	1150
FREE	9808 (9.6K)	2650
Total FREE:	14272 (13.9K)	

Total bytes available to programs (conventional and upper): 616752 (602.3K)

Largest executable program size: 602096 (588K)

Largest available upper memory block: 9808 (9.6K)

For CD-ROM users, MemMaker is the most important new DOS function. If you don't have a memory manager, this program alone justifies the cost of the upgrade. MemMaker's task is to load as many drivers and programs into high memory as possible. This means DOS itself, as well as your mouse driver, your CD-ROM driver, and your sound board drivers. If it can pack everything into high memory (and it often can), you can easily come away with 620K or more bytes of available conventional memory. Even a machine packed with fax boards, hard cards, and other kinds of devices will see a considerable improvement.

DoubleSpace loads easily and fairly quickly, and it increases your hard-drive space by 50-80 percent. Like MemMaker, it's not as aggressive as third-party programs, but because it's part of DOS it does not require, as *Stacker* and *SuperStor* do, two separate CONFIG.SYS and AUTOEXEC.BAT files. This is a very welcome addition to DOS, and it will be interesting to see how third-party developers can exploit it to offer even better compression.

A warning is in order here. DOS 6.0 includes a hard-drive defragmentation program called Defrag. Basically, it moves associated files close together to improve drive-access speed. If you type DEFrag from the DOS prompt, though, and you're using a DoubleSpace drive, the process can take several hours *without* telling you how to stop it. As it turns out, all you have to do is hit the Escape key — but it should have been made clear via a screen message.

Is DOS 6.0 worth the upgrade price? Yes, if you need the utilities, but probably not if you don't. In all likelihood, however, this is the last version of DOS you'll be able to ignore. DOS 7.0, from all reports, will change things significantly.



DOS 6.0: Should You Upgrade?

DOS 5.0 was such an immediate success that it was only natural to look forward to version 6.0 with huge expectations.

Microsoft had promised, after all, to include a host of new features: hard-disk compression, automatic memory management, virus checking, and a host of other utilities previously found only in packages such as *Stacker*, *386MAX*, *PC Tools Deluxe*, and *Norton Utilities*.

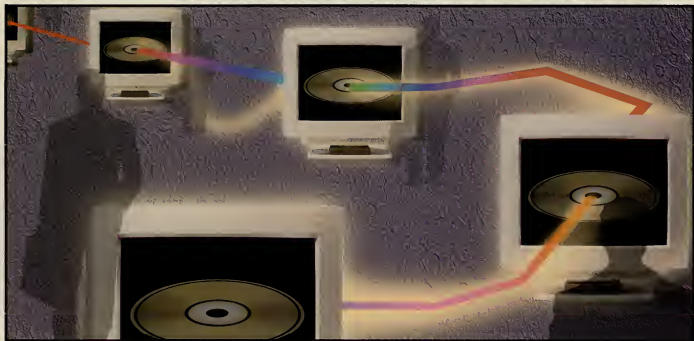
DOS 6.0 is here. And for the most part, it performs as promised. You can move files from directory to directory, rather than copying them and then deleting the source. You can also delete directories and their subdirectories without cleaning them out first. Two jobs, in fact, that Windows can do anyway.

Essentially, though, 6.0 — compared to 5.0 — is an enhanced utilities package: not much has changed at the core of DOS itself, but there's less need to rush out and buy third-party add-ons. Not a single 6.0 utility works as aggressively as its third-party counterpart, but if you have both 6.0 and these third-party packages, there's

little, if anything, else you'll need.

For the CD-ROM owner, DOS 6.0 offers two significant enhancements and one nice touch. The first enhancement is MemMaker, a program that automatically handles memory management. Next is DoubleSpace, which compresses data on the fly and thus increases your available hard-drive space. The nice touch is the inclusion of the MSCDEX.EXE — the CD-ROM hardware driver — in DOS itself.

MemMaker is DOS's version of memory management programs such as *QEMM-386* or *386Max*. To access it, simply type MEMMAKER at the CA prompt, and it will let you choose between Express or Custom setup. If you choose Express, you need do nothing but sit back and watch (on a 486-33, the process takes about three minutes). Custom lets you specify a few options, including the use of the memory addresses reserved for monochrome monitors (an area of memory usually wasted). MemMaker will also set up expanded memory if you need it.



Sharing the Wealth

The popularity of the Windows operating system took even Microsoft by surprise. Now, scores of organizations are turning to *Windows For Workgroups* for plug-and-play networking capability: Without the hassle and administrative worries of traditional networks, *Windows For Workgroups* (WFW) provides instant shared access to each computer's disk drives and printers.

Since WFW is a stand-alone peer-to-peer network, each machine can access any other machine's files and print on any printer, without requiring a full-time file server as with *Novell Netware*. Just drop a network card in each machine, string a few lengths of cabling, install WFW on each machine in place of Windows 3.1, and you've got yourself a ready-to-run file sharing solution.

Windows for Workgroups makes it appear that the disk drives of all con-

How to Create a CD-ROM Network with *Windows For Workgroups*

Charles Brannon

nected users have somehow become installed inside your computer. And since a CD-ROM drive functions like a disk drive, you can share your CD-ROMs on

the network too, with just a few simple techniques.

The CD-ROM Advantage

If you want to share CD-ROM titles among many machines, you can install a CD-ROM drive in each machine, or install just one CD-ROM in one computer. Since a network card costs less than a CD-ROM drive, you reap immediate savings.

You can buy huge CD-ROM collections of clip art, making a virtual museum of art available to all members of your workgroup. You can buy True Type fonts by the hundred on compact disc, and rather than clog up everyone's hard drives with typefaces, just load these from the drive.

Another convenience with CD-ROM is that you can install from a single disc rather than from a dozen or more individual floppy disks. Just click on the

install button and walk away until it's over, rather than babysitting the machine, stuffing another disk in its maw whenever it cries for more. When networked, you can attach another machine to the CD-ROM and install the files conveniently over the network.

Keep in mind that most CD-ROMs are sold with the expectation that they will be run on a single machine, with a single-user software license. There may be limits on how the CD-ROM can be shared on a network. Read the license agreement on the envelope or tape seal on the jewel box before you open it, and return the package to the store or manufacturer if you can't abide by it. Ask a legal expert for an opinion, or call the software publisher if necessary.

Caveats

Before you jump into setting up WFW just to share CD-ROMs, be aware that there are some difficulties. Most obviously, other users won't be able to hear any sound when a CD is playing audio data. And sharing a CD-ROM will possibly require you to install sound cards and other multimedia upgrades to the other networked machines. CD-ROM access, not known for its zippiness, is even slower on a network.

Multuser access to a CD-ROM introduces a new problem: How do the users without the drive change discs in the networked player? Whoever hosts the CD-ROM drive could be getting a lot of phone calls and Chat messages asking for disc changes. And what if one user wants a disc change while another user is still reading the current disc? One way around this hassle is a multi-CD player, such as Pioneer's, which can store five or more CDs in a carousel or cartridge, swapping them out by computer control. But it still limits users to accessing one disc at a time, of course. It may be most practical

to consider a networked CD-ROM as dedicated to a single disc, with changes occurring only rarely, when the CD is taken "offline" temporarily.

How to Share a CD-ROM

There are two steps in sharing a CD-ROM: First, make the CD-ROM shareable on the machine that contains it (the host machine), then connect each user's machine to the CD-ROM. (This discussion assumes the host machine is already set up for CD-ROMs with WFW, and that WFW is installed on all machines that need to access the CD-ROM.) If the host machine is a 386, it must run WFW in 386 Enhanced Mode. You can connect to and read the CD-ROM from standard mode, as well as on a 286 (and from DOS if you have Microsoft's Workgroup Connection), but the host machine must have a 386, a 486, or a

potent Pentium. Be sure that your CD-ROM drive is up and running, and test it with Windows 3.1 before installing *Windows For Workgroups*. WFW will automatically update your copy of MSCDEX and make some changes to the line if necessary.

When you offer, or share, your CD-ROM drive, you're making it available for future access by other users. (They still have to connect to it from within Windows, but they don't need to alter their system files, and they don't even need to load MSCDEX on their machines.)

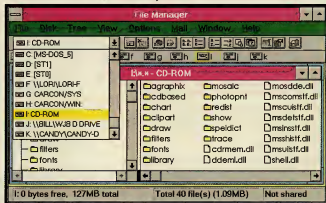
Use File Manager to declare that a drive

is available for others to read. Since you can limit how much is shared, and can even use passwords to determine who's allowed to read or write to the drive's directories, you don't have to worry about anyone snooping around your computer from afar.

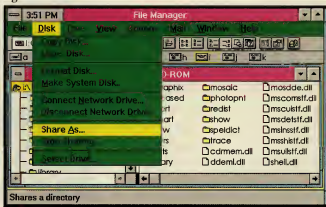
Many of us don't use File Manager all that often, even though it is a fairly accessible tool for managing drives, files, and directories. But you don't necessarily have to learn the in's and out's of file management to share your drives. Performing these simple steps will do the job.

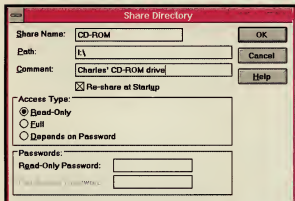
CD-ROM Sharing: Step by Step

1. Run File Manager.
2. Click on the drive letter of the CD-ROM in the drive toolbox, or click on the drop-down Drive List box and choose your CD-ROM.



3. Choose *Share As* from the *Drive* menu, or click on the *Share* button in the toolbox.





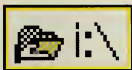
4. The *Share As* dialog box opens up (above). Enter a descriptive name for the drive, e.g. CD-ROM. This name will appear in the other users' Connect dialog box.

5. The second item, showing the drive letter, should show the name of your CD-ROM. If not, click on it to choose the drive letter.

6. Press TAB or click the mouse to get to the Description. Enter a more specific description of the CD-ROM drive.

7. Click on the *Re-share at startup* box. This option makes sure that the CD-ROM drive is available for sharing every time you start WFW. If it's not checked, you'll have to repeat these steps after starting up WFW whenever you want to share the drive.

8. Only use a password (the read/write password is meaningless for CD-ROMs, but is sometimes useful when sharing a hard-drive directory) if access to the CD-ROM drive itself needs to be confidential.

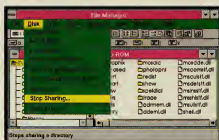


9. When you click on OK, a tiny icon (pictured above) appears next to the drive or directory name. If you don't see it, make sure you're still viewing the CD-ROM directory.

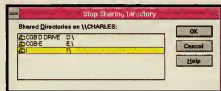
10. Close File Manager if you like — it's not needed after you've shared the drive.

How to Stop Sharing

1. Choose *Stop Sharing from the Drive* menu, or click on the Stop Sharing icon.



2. Choose the drive letter of the drive you want to stop sharing from, then click OK.



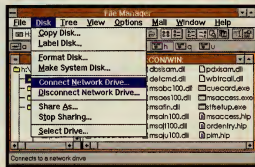
3. If any users are currently connected to the drive, you'll have to reconfirm your choice. This message doesn't always mean someone is currently reading the drive, but rather that they are connected to it.

4. Once you stop sharing, you'll have to repeat the steps in the section "CD-ROM Sharing: Step By Step" in order to re-establish sharing.

Connecting to a Shared CD-ROM

Move to one of the other machines, and run File Manager. Note that there's no drive icon yet for the host's CD-ROM.

1. Choose *Connect* from the Disk menu, or click on the *Connect* icon.



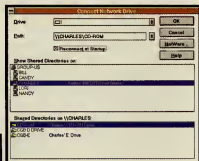
2. The *Connect Network Drive* dialog box appears. Double-click, if necessary, on the name of the workgroup you want to access.



3. Double-click on the name of the machine hosting the CD-ROM. If you don't

see it, the host user may be logged out, powered down, or just logging in. It can sometimes take a minute for your workstation to learn that another one has just logged in. (If you still don't see the name, that machine may be on another workgroup.) Now double-click on the drive (called CD-ROM, if that's how you set it up). If the drive is absent, the host has stopped sharing the drive, or needs to reshare the drive.

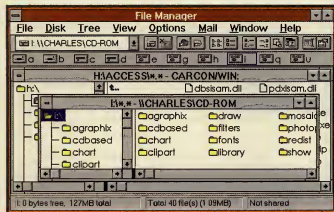
4. If a password was established when the CD-ROM was shared, you'll have it enter it now. If you get disconnected any time in the future, this password is stored in your password file, so the drive can be reconnected immediately.



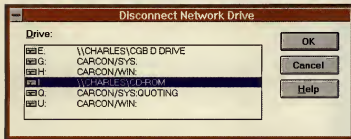
5. Usually you'll want to enable *Reconnect At Startup* so your CD-ROM connection will reappear whenever you restart WFW. See "Automatic Reconnection" (below) for more details.

6. There will be a delay, then

the newly minted disk drive's window pops up in the middle of your file manager (shown below). You can quickly verify that you have access to any of the files.



Sometimes you'll want to disconnect from a shared drive. This will speed up your computer slightly. Choose *Disconnect Network Drive* from the *Drive* menu, then choose the drive you want to disconnect in the Disconnect dialog box.



Connecting Within a Common Dialog Box

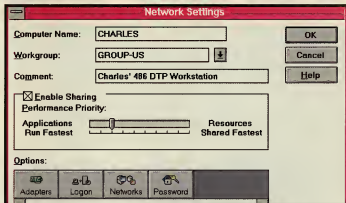
Windows 3.1 introduced common dialog boxes for opening, saving, and printing files. WFW adds a *Network* button, which works exactly as the *Connect Icon* or *Drive/Connect* menu selection in File Manager. After connection, the drive letter appears on the Drive List Box and you can enter it directly in the pathname of the document you're opening or saving.

Once connected, the remote CD-ROM drive behaves like a real disk drive. If the CD-ROM is extremely slow (and it will be if many users are trying to access it at once), the host may need to sacrifice

some of his or her overall speed in order to devote more time to handling the sharing requests.

To fine-tune CD-ROM access speed,

pop up the Control Panel from the Main Group in Program Manager. Double-click on the *Network* icon. The *Network*



Settings dialog box appears (at right).

For now, you're only interested in the slider in the middle.

To the left, your machine is most selfish, running nearly as fast as it can. To the right, your machine is most altruistic, practically becoming a

dedicated file server, since everything else slows down so much that it's not really practical to run applications on it. You'll find a happy medium by adjusting the slider as necessary to get the right performance mix.

There are two Windows Accessories added to WFW for drive sharing: *Net Watcher* and *WinMeter*. Use *Net Watcher* to see who's connected. *WinMeter* shows the effect of file sharing on the host machine's performance.

Automatic Reconnection

One problem with WFW and other peer networks is that all connected machines

must constantly stay turned on to make sure everyone can read everyone else's drives when needed. Since this is a rare occurrence in the real world, you'll often get error messages when you start WFW. You'll get a message asking if you want to continue restoring connections. If you're aware that all the machines you're connected to aren't turned on, you'll save some time by choosing *No*. In any case, if

a host machine joins the network at any time during the session, the drive letter is automatically reattached when you try to use it.

One Terrific Bonus

Perhaps it isn't prudent to invest in a WFW network just to share a CD-ROM drive, even if it costs less than putting a real CD-ROM drive on each machine. But if you already have WFW, the ability to share your CD-ROM is a terrific bonus. For *Novell Netware* users, there's no better solution for sharing CD-ROMs in Windows, so WFW is a great way to add peer-to-peer capability that includes CD-ROM sharing in an existing Windows setup under *Netware*. For the right applications, such as professional, educational, and scientific databases, clip-art libraries, self-published CD-ROMs, shareware, and other software treasure troves, *Windows For Workgroups* can be an excellent way to share the wealth of CD-ROMs with everyone.



Tandy's Sensation!-al Strategy Multimedia For the Masses



Tandy's plug-n-play Sensation! MPC system may not wow industry insiders, but it's impressing thousands of first-time buyers.

Selby Bateman

Bob Miller has never been quiet about his love/hate relationship with personal computers. As vice-president of merchandising for Radio Shack, he's constantly working to understand what consumers want and don't want. And, in his opinion, personal computers have just been too hard to use for most consumers.

"I used to harangue people," he says with a laugh. "Go on! Take it out of the box and see if you can make it work!" Too often they couldn't.

That's one of the reasons that Miller and a lot of people at Radio Shack and its parent company, Tandy, couldn't be happier right now. They've created a multimedia computer system — the Sensation! — that consumers in large numbers are saying is the plug-and-play package they've been waiting for. Introduced last November, the Sensation! has acquainted a large number of entry-level computer owners with the unfolding world of multimedia.

The system is basically a 25MHz 486SX computer with a built-in CD-ROM drive. But it's the tightly integrated nature of the hardware and software that makes the Sensation! not only easy to use, but quite a multimedia Swiss Army Knife for just over \$2,000. (See "The Sensation Formula" sidebar.)

Although Tandy and Radio Shack officials won't discuss sales numbers, it's clear from other sources that the Sensation! surprised a lot of folks during the 1992 holiday season and during the first half of 1993. There's enough momentum there for Radio Shack to roll out a major Sensation!-based marketing initiative right now that includes national television advertising and large-circulation general-interest magazines.

"That would only occur if we felt we had a hot category," says Mike Grubbs, senior director of Tandy marketing. "We've been at this multimedia thing for a while. We were the pioneer of the MPC (Multimedia PC standard). We spent about two years out there pushing the generic MPC banner with some product lines. And last year we said, 'OK, we think we know enough about this to package a multimedia product for the masses, for use as a family system, for use in the classroom.' And that's where Sensation! came from."

Tandy's Sensation! and the company's evolving retail strategy are today arguably doing more to expand the base of personal multimedia than any other manufacturer. In addition to its 7,000 Radio Shack stores, Tandy is reportedly planning to open almost three dozen 25,000-square-foot Computer City stores during the next two years and add a few more 160,000-square-foot Incredible Universe consumer electronics superstores as well.

As Tandy Chairman and CEO John Roach told shareholders: "Radio Shack is the ultimate electronics convenience store and market leader for many of the



The new Incredible Universe superstores are a cornerstone of Tandy's retail push for multimedia and consumer electronics.

products it carries; Computer City is the complete computer superstore; and Incredible Universe...is the ultimate electronics destination and entertainment store."

Some industry observers say that the Sensation! is too low-end, too slow, and encumbered with a simplistic user interface. First-time computer owners are apparently saying the system is easy to use, versatile, non-threatening, and priced right.

When power users and computer hobbyists tell Bob Miller that they're going to strip away the Tandy user interface and the optimized, preconfigured software, Miller says, "OK, go ahead."

"But we had no intention of going out there with the Sensation! and getting the computer hobbyist. That was not the audience," he says. "We wound up developing a computer that actually hit a couple of markets. "One, it

hit the person who was not computer literate — and gave them something they could actually take home and plug in and play. Secondly, it hit a group of more sophisticated people who said, 'Wow, I didn't know Tandy could make something like this.' It's pretty cheap when you consider what you're getting."

In Tandy's strategy, the key to the success of significantly broadening the consumer



Is the Sensation! system the Tandy 1000 computer of the multimedia '90s?

market for multimedia in the future will be optimizing and preconfiguring the hardware and software. Bundles of hardware and software are proliferating, and they range from those that are just thrown together to those, like the Sensation!, that really are a package. Just as NEC is touting its

Solution Series of computers for business, Tandy is leveraging years of Tandy multimedia research to create a highly usable, entry-level solution for consumers.

Radio Shack's new ad campaign stresses the Sensation!'s usefulness and its user-friendliness: "This Could Be The Most Expensive Paperweight Ever Invented. Or It Could Be The Most Intelligent Purchase Your Family Ever Made." And the tag line to the ads: "Not just IBM-PC Compatible, Family Compatible."

"We've taken great pains and spent a great deal of effort and money and creative resource in packaging the multimedia in a highly integrated way," says Grubbs, "which is how we turned the corner to something you take home, plug in, turn on, and it works."

Even the packaging, with "The Lifestyle Computer" slugline and packaged-goods look and feel, is meant to convey the idea that the Sensation! is as easy to get into and use as a box of soap powder.

But, as Tandy and Radio Shack officials know, multimedia computing is a moving target that's constantly being pushed to higher levels of performance. The Sensation! is meant to evolve over time, taking advantage of new technologies and improved price-performance ratios.

"It's a flexible system," says Miller. "And obviously, if we find that a tax program is important or voice mail is important to our customers, we'll be listening."

Adds Grubbs, "You can assume that we're not going to sit on our laurels in the area of integrated multimedia.

"We will incorporate new multimedia technologies as they come along, incorporate better software as we learn how to do that. And then, as we're able to talk to the people who bought Sensation! and the store people who sold them, we'll develop an expanding base of experience on what it really takes to make this stuff work."

Grubbs feels that the tightly integrated nature of the Sensation! is helping Tandy stay ahead of the competi-



Unlike the Sensation!, the jury is still out on the slow-moving VIS.

tion. "The good news is that there are lots of people talking about multimedia and selling...let's call them "multimedia-capable" systems. The bad news is that most people are just throwing parts into a system, throwing in some

software, and shoving it out there and calling it multimedia. That is not, in my view, what it takes to sell multimedia."

Another Tandy multimedia product, introduced just after the Sensation!, has so far had a different retail reception. The VIS — Video Information System — is a living-room product that hooks to the television and lets consumers play a variety of entertainment, education, and information titles. The system uses a form of Microsoft's *Modular Windows* user interface, and now has close to 70 different pieces of software available. But the VIS's slow start prompted Tandy to reduce its retail price from \$699 to \$399, just six months after its fall 1992 debut.

As with similar systems, such as Commodore's CDTV and Philips' CD-I, Tandy's VIS has not caught on in big numbers. All three competing systems hook to a television, look like a VCR, and have a respectable cast of supporting software. Consumers, however, have not rushed to bring any of these systems into the home.

But Tandy's Mike Grubbs does think that the strategy of basing VIS on a close cousin of the industry-standard *Windows* user interface will serve the company well as the technology advances. Commodore uses an Amiga computer-based operating system and Philips uses a proprietary system based on its own CD-I technology. The new 3DO multiplayer system, planned for introduction later this year, will also use its own proprietary operating system.

"We started with an MPC architecture, and then optimized it for the living room," says Grubbs. "Our view is, let's leverage everything that's going on in the industry. Let's not try to go create a new industry infrastructure. And one of these days we're going to figure it out."

Will VIS be around for a long time as an evolving system, like the Sensation!? "If it sells," says one Tandy official. "If it sells."

THE SENSATION! FORMULA

Is the Sensation! computer the Tandy 1000 of multimedia computing? Tandy's Mike Grubbs thinks it might be. The venerable Tandy 1000 turned out to be a big success, spearheading the IBM-clone wave back in the mid-1980s. Thousands of people were introduced to personal computers through the Tandy 1000, and the Sensation! is positioned to follow suit.

The package that makes up the Sensation! is not difficult to describe, nor to understand. But, as Grubbs says, "It didn't happen overnight." It's obvious that a great deal of planning went into the final mix, and you can bet that a number of hardware manufacturers are poring over the bundle to see how Tandy approached the plug-and-play model.



Microsoft Bookshelf is integrated into the Sensation! system.

The Sensation! is a 25MHz, 486SX MPC-level computer with 4 megabytes of memory (expandable to 32MB), a 3.5-inch 1.44MB floppy drive, 107MB IDE SmartDrive hard disk, and CD-ROM drive with 375-millisecond average access time. Also included are Tandy's multimedia palette chip for faster animation and 16-million color display, Super VGA graphics with 512K video RAM (upgradable to 1MB) and a Windows accelerator. Tandy's enhanced MPC sound system is on the main logic board, with a 12-bit ADC and DAC converter, an FM synthesizer, a 2400-bps modem with voice-mail capabilities, and 4800-baud fax transmission.

Also included are three 16-bit expansion slots; serial, parallel, MIDI, mouse, and dual joystick ports; and stereo line-out jacks. Volume control, speaker, microphone, and headphone jacks are on the front of the system. All of this, plus a Super VGA color monitor, retails for \$2,199. There's an optional PC/TV add-in board for \$399.95 that turns the Sensation! into a high-resolution TV set, and you can add an optional \$99.95 amplifier/speaker combo.

What new users encounter when they turn on the

system is Tandy's WinMate user interface on top of Windows 3.1. Already loaded into the system or available on CD-ROM are *Microsoft Works for Windows*, including word processing, spreadsheet, and database.

Microsoft Bookshelf for Windows's multiple-source reference CD; and online software for Prodigy, America Online, and The Sierra Network.

The WinMate front end displays eight windows offering applications, games, services, and information.

In Touch — telecommunications applications, including the TeleMinder voicemail system that can be used as a telephone answering machine, an audio memo system, and a remote-access messaging center. Also includes terminal software for the online services previously noted.

In Print — a collection of printing applications for banners, greeting cards, name tags, notices, and the Graphics Manager "picture library" of images.

In Control — more than a dozen home- and education-oriented templates for use with *Microsoft Works*, including files for collections ranging from antiques and baseball cards to stamps and wine.

In The Know — a variety of educational and informational resources, including *Microsoft Bookshelf* applications such as *Bartlett's Quotations* and *The Concise Columbia Encyclopedia*; multimedia demos showing the Sensation!'s features; and WinMate and Windows tutorials.

In Charge — organizational tools such as a business address book, calendar, clock, travel planner, and more.

In Play — a collection of simple games and educational programs, including *Hangman*, *ABCs*, *Type Defense*, *Math Drill*, and *Prizler*.

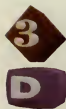
In the Bank — a set of financial organizing and tracking tools, including a calculator, household budget, checkbook balancer, investments portfolio, and the *Microsoft Money* financial management application.

Inside — the entry point to all of the Windows and Works features.

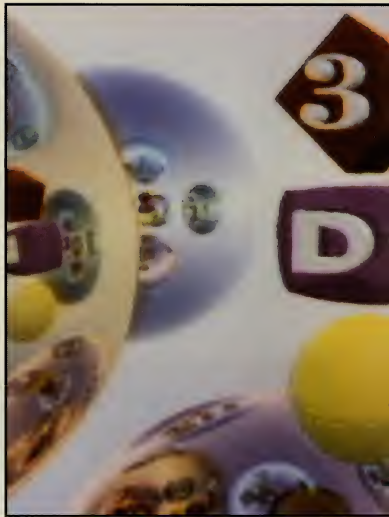


The TeleMinder voicemail system can be used as a telephone-answering machine as well as for other telecommunications purposes.

THE MACHINE WITH A MISSION



Raises the Stakes



KATHY YAKAL

“It’s the future, and you can’t ignore it.”

This sentiment from a prominent game publisher is echoing through the hallways of many software development houses these days. And the “it” they’re talking about is the

3DO multiplayer system.

In the five months since 3DO’s announcement took the 1993 Winter Consumer Electronics Show by storm, a growing crowd of developers, publishers, and manufacturers have been pushing and shoving to find out more about what 3DO founder Trip Hawkins calls “full digital synergy.” If you haven’t heard those three words used together before, you probably will later this year if Hawkins has anything to do with it.

The new platform, expected to debut this fall, is the brainchild of Hawkins, founder of ten-year-old Electronic Arts. Hawkins steered EA to

its leading position in the ranks of entertainment software publishers. Today, EA is valued at a whopping \$200 million.

Joining Hawkins as partners are several corporate giants: Matsushita, the largest consumer-electronics manufacturer in the world; AT&T, the largest worldwide communications company; Time Warner, the world’s largest software company and second largest cable operator; and MCA, another Hollywood giant and co-inventor of the laserdisc. The 3DO group is in the process of licensing its technology in hopes of creating a new consumer-electronics entertainment system for the home. The 3DO magic box that will plug into your TV set has been officially dubbed the Interactive Multiplayer, and if you believe some early observers, it’s best described as “an Amiga on steroids.” Panasonic, a brand name for Matsushita, is manufacturing the players.

By making projections based on comparisons



CD-ROM player. Audio, still images, full-motion video, and lots of special graphics effects (Hawkins' "full digital synergy") will be present in nearly every application.

"The same system will play standard music CDs, let you look at your family photos on CDs, and have interactive CD software that brings you entertainment, education, and information," Hawkins says. "Another possibility is watching movies on CD. Later on, the consumer might want to edit home movies or learn to play a musical instrument. An add-on module will access network services."

Hawkins likens the difference between coin-operated video games and 3D0 entertainment to the giant step taken when motion-picture technology allowed its producers to start moving the camera: "A whole new sense of intimacy occurred for the viewer."

Sixteen Bits In the Back of the Closet

The 3D0 machine has the potential to be a technological tour-de-force. It is, without doubt, on the cutting edge. From the start, Hawkins says, the goal was to "max out" both color and animation in the system. In trying to provide a home-entertainment experience clearly superior to anything else on the market, the 3D0 team wants to give software developers the processing power to do things never before done on a low-cost consumer playback system: the ability to create scenery with multiple layers, photo-realistic backgrounds, and numerous independently animated foreground objects, as well as the capability to produce realistic shadowing, lighting, and weather effects.

According to Hawkins, the 32-bit RISC architecture, which includes two custom graphics chips, gives the 3D0 system 50 times more graphics and animation power than a 16-bit system.

3D0 systems will offer software-based motion video and full-motion video (FMV) technology for VHS-quality digital video playback (the latter will require a plug-in cartridge). Input devices like control pads, mice, keyboards, and 3D glasses are also in the works.



Trip Hawkins, 3D0's president and CEO, demonstrated the Interactive Multiplayer at the Winter Consumer Electronics Show.

to dollars expended for more traditional forms of entertainment, Hawkins and company believe that 3D0 is a potential \$17 billion venture.

The enterprise hopes to

see its platform become as dominant in the home entertainment market as VHS is in the VCR market. But the war for supremacy in the home market is more complex than the classic Beta-VHS battle we watched ten years ago. The competition — multimedia personal computers, Nintendo, Sega, and CD-I — is well entrenched.

The Interactive Multiplayer will include a





Panasonic, a brand name of 3DO strategic partner Matsushita, is manufacturing the player.



Where's The Software?

Every new platform must face the old chicken-and-egg dilemma: new hardware does not sell unless software is available at the get-go. And the software had better be good. The 3DO group anticipated this nicely. To date, nearly 100 software publishers — including Paramount,

Virgin, Electronic Arts, Maxis, Sierra, and Spectrum HoloByte — have signed agreements to produce applications.

Software development is done on the Macintosh, using a proprietary set of tools called Cinematic Software Tools, as well as a library of sound effects, musical scores, video clips, and photographs.

Programmers work with a palette of up to 16 million colors (television can display up to 2 million, and 16-bit systems can manage 256). The proprietary toolbox allows for rapid scaling and manipulation of on-screen objects — all in a three-dimensional environment. Outside of graphics workstations, this has been impossible up to now.

The risk and the rewards are great for the developers who have made the 3DO commitment. Their job is to create entertainment titles the likes of which we've never seen. But they're up to it, and they're excited. "We're thrilled with what we've seen so far," says Judith Lange, president of start-up software company Crystal Dynamics. The new 20-employee company was formed to develop applications for the next-generation machines, and 3DO was

their platform of choice. Crystal Dynamics hasn't yet released information about its 3DO software, but it will premiere two titles at the Consumer Electronics Show in Chicago this June.

Other developers are being equally close-mouthed about what they're working on (as well as how much the new software will cost), although Gametek has stated that its first two titles will be flight simulators. Six-year-old Gametek, which has made its mark in the Nintendo and Sega video-game arena, now has a computer-software division. And that's caused a lot of excitement at the Miami-based Gametek offices. Executive Vice-President Bruce Lowry says that CD technology gives developers a lot more to work with than the cartridge format.

Bill Crowe, director of development at

Sierra, agrees. "We're really excited about the technical possibilities it offers. And as in any good business decision, that's tied to our belief that 3DO has put together the right ingredients, and that the platform will represent a significant market share."

Sierra hasn't announced any titles, but Crowe says that the company will focus on its current areas of expertise, and that means epic adventure games. But it probably won't end there. "Certainly as we work on the development, we'll be looking at all the ways its advantages over other platforms can be used."

Lowry was impressed by the demos he saw on 3DO, liked the new company's philosophy, and was comfortable with the investors involved. "We see it as being a very strong platform for entertainment," he says. And it was Lowry who added: "It's the future, and you can't ignore it."



3DO's developer kit, known as Cinematic Software Tools, lets programmers create special lighting and shadowing effects.



This scene from Jurassic Park, an MCA title in the works, shows how depth is used to create a 3-D effect.

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Yesterday's science fiction is today's reality, thanks to the bounding leaps made in silicon-based technology over the past few years. There's a great deal of excitement in being present at the birth of a new technology, and none is more personally stimulating than multimedia.

Just as we now regard the telephone and television as commonplace, the interactive multimedia system will someday be as ho-hum as a Sunday call from your aunt in Eau Claire. While most of us probably don't appreciate the giant step being taken as video and audio technologies converge in a new medium, it may only be because other breakthroughs have eased the way. PCs, VCRs, and CD players have helped us grow accustomed slowly to the burst of late twentieth-century advances in technology.

Philips, a Dutch company whose

Philips' Continuing Commitment

Kathy Yakal

products we use — Magnavox and Sylvania, for example — but whose name we usually don't, has led the way in the development of CD-based technology. Along with Sony, Philips pioneered audio CD technology in 1980, and explored CD-ROM technology several years later.

Along the way, Philips engineers figured it would be pretty easy to hook up a CD player to a television set. The result was a machine that uniquely implemented CD-ROM technology, one that was conceptually different from the

keyboard-based personal computer with a CD-ROM drive. The new CD platform had its own format for storing and retrieving data, video, and audio. It was introduced as Compact Disc-Interactive, or CD-I.

An Interactive VCR

Because of the technical complexity involved, it took several years for CD-I to come to the consumer market. It finally arrived a couple of years ago in the form of a CD-I player dubbed by Philips as "The Imagination Machine." Retailing for \$699, it met with slow sales, and has, quite frankly, moved off shelves slowly. However, Philips was encouraged by late 1992 sales after dropping the price to \$599 and bundling the player with *Compton's Interactive Encyclopedia*. The latest model, the CD1220, is a faster and more powerful player than the previous

models, dating back to 1991. Philips' player looks like a sleek VCR, and plugs into a TV set in a similar way. It comes with a "thumbstick" remote control for moving the on-screen cursor, with menu items selected by pressing a button. Trackball-like controllers are also available for CD-I games.

The CDI220 will play any compact disc that adheres to the CD-I standard, championed by Philips. Almost 100 titles, with prices ranging from \$15-\$60, are currently available, and nearly 200 more are available worldwide.

In a fashion similar to the way personal computers moved into the home, Philips started by introducing games and children's software, and some instructional titles dealing with learning processes, such as how to play a musical instrument.

Now, according to Bernie Luskin, president of Philips Interactive Media, Philips is entering "third-stage product": full-motion video, manipulation of characters in software, the use of multiple planes and animatronics, and 3-D animation — "...all the things that [George] Lucas used when he broke through with *Star Wars*."

In keeping with Luskin's reference to third-stage product, Philips recently announced the FMV, a cartridge-like unit that, according to Philips, brings full-screen, full-motion video to CD-I players. The FMV plugs into a socket on the back of all CD-I machines. It conforms to the MPEG1 digital-video

standard, and allows up to 72 minutes of video from a single CD-I disc.

When announcing the FMV at Intermedia, a multimedia conference held this past April in San Jose, Philips emphasized the interactive technology of the FMV cartridge. Features include seamless jumps (branching to alternate paths in the storyline without a noticeable break or stutter in the video); VCR-like controls (also slo-mo, freeze, and

than paying for an evening out.

"We're on a lifeline back to viability," says Luskin of the move toward home entertainment. Motion-picture studios are looking seriously at the possibilities of home interactive entertainment, and Philips Interactive Media currently is building relationships with them, as well as with developers of reference, educational, and game software. "We'll give Saturday morning TV a run for their

money," says Luskin.

But Philips' audience extends well beyond today's children. Luskin notes that people will use an interactive product for three things: personal growth, correction of a learning deficiency, or fun.

Those three goals have been addressed by Philips Interactive Media in the titles now available for its CD-I



The latest version of Philips' CD-I player includes a copy of Compton's Interactive Encyclopedia.

single-step actions) for use with movie sequences; and windows laid over full-motion video.

The FMV is now available to developers, and it should be ready at the retail level sometime this fall in the \$200-\$250 price range.

An Orderly Progression

The steady movement of CD-I into the 2,000 stores where it's now available has been timed well, according to Luskin. In a worldwide recession, people stay home more, and opt for cheaper entertainment there, rather

player. And the diversity of the software reflects these goals. Among the current crop of CD-I titles are: *Compton's Interactive Encyclopedia*, *Richard Scarry's Best Neighborhood Disc Ever!*, *A Visit To Sesame Street*, *The Palm Springs Open*, *Caesar's World of Gambling*, *The ACT College Search*, *Dutch Masters of the Seventeenth Century*, *Louis Armstrong: An American Songbook*, and *Time-Life's 35mm Photography*.

Titles in the works include *Rebel Assault*, an arcade-action shooter based on the *Star Wars* films; *Little Monster Goes to School*, an animated "talking book" derived from Mercer Mayer's "Little Monster" book series for children; and



Philips has developed a library of software targeted to all ages and interests.

The Man Behind Philips Interactive Media



Dr. Bernard J. Luskín

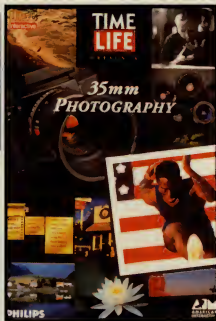
As founding president of Philips Interactive Media, Dr. Bernard J. Luskín—educator, psychologist, and computer engineer—is uniquely qualified to help shape the company's continuing presence in the personal multimedia market of the 1990s.

Luskín has worked in the media, founding a television station in Orange County, California, and playing a pioneering role in the development of telecourse education. He's held faculty positions at several universities, and served in staff positions with the U.S. Senate and as a member of the Science Education Committee of the National Science Foundation.

His pioneering work extends to the computer field. Luskín wrote the first high-school data-processing textbook, among other books and articles. He directed one of the early IBM Management game centers, and helped install the first computer in a community college in 1961. And he's also a licensed psychotherapist.

It's easy to see why a leadership role in the growth of personal multimedia has come so naturally for him. Luskín was there during the birth of Philips Interactive Media in 1986, when CD-I was still just an idea. He traveled worldwide for approximately a year, asking software developers to describe their dream format, then worked with technical experts and entertainment people and educators to bring the products to market.

Luskín speaks enthusiastically about the last seven years, spent patiently waiting for technology to allow Philips' vision to become reality. Today, he smiles when he talks about the dozens of titles that grew from this critical research. As Luskín notes, "Everything I've learned about learning is involved in these materials."



Kathy Smith's Personal Trainer, based on Smith's workout video line.

A Glimpse of the Future

What's next in CD-based technology? According to Luskín, a new wave of interest by multimedia developers will involve understanding and implementing media psychology, specifically in areas such as hypnotic induction techniques.

Another future trend likely will be personal control of the medium. Maybe you'll buy your television entertainment in increments of megabytes. Or, if you're watching the Academy Awards on a smart TV, you might have control over six cameras, allowing you to see much more than the single camera shot that today's programs let you view.

Whatever direction the evolution of electronic home entertainment takes, a CD-based engine will be in the picture for some time to come, adding a greater amount of intelligence to the TV medium, says Luskín. And even with companies like 3DO on the near horizon, Philips is counting on being one of the key players leading the way.

Sega Sets the Pace CDs Migrate To Video Games

Randy Chase

For a growing number of consumers, the introduction to multimedia software will come from video-game machines sporting CD-ROM players rather than from personal computers.

This new spin on the video-game platform will likely shrink the chasm that has separated the world of video games from that of computer software.

Two years of indecision by Nintendo left the door open wide for Sega to pioneer the CD-based video-game idea with the fall 1992 release of the \$300 CD player for the Genesis.

Actually, Sega wasn't the first video-game system to support CD technology. For two years, NEC has offered a CD player for its TurboGrafx-16 — but this system's limited market presence and inability to attract consumers never established it as a serious competitor to the game machines of Nintendo and Sega. To date, NEC has sold 100,000 CD-based game systems compared to the 200,000 units sold during the first two months the Sega CD player was available. Sega is now projecting an installed base of more than one million users by the end of this year.

While the TurboGrafx has failed to generate any real support by major software companies, there seems to be no shortage of enthusiastic endorsement for Sega's CD platform. Many leading entertainment software publishers, including Electronic Arts, Acclaim, MicroProse, The Software Toolworks, Tengen, and Sierra have announced products for release this year.

Mark Beaumont, vice president of Entertainment Products for The Software Toolworks, explained the company's commitment to support the Sega CD. "With any platform, we look at the commercial viability to see if there is a large-enough installed base to make it worth supporting. Sega's performance at Christmas created an instant market."



In the world of video-games, the hot topic is CD players — they're selling, and more are coming. Sega has a strong early lead, but there's competition on the horizon.



Like the Sega Genesis video-game machine, the Sega CD player has its own Motorola 68000 processor. The horsepower is there, but none of the early titles do justice to the hardware.

He cautioned, however, that it would be late in the year before consumers could expect to see top-flight CD products for Sega. "You need to spend a good year in development to take advantage of the new hardware's capabilities and to fill a CD with a product that gives the consumer a good value for their dollar."

As with computer-based CD-ROM, the current Sega technology falls short of delivering full-motion video. The gap between PC-based CD-ROM video and the familiar television screen continues to narrow, although the current capabilities are still often described as *not quite* TV quality.

Reaction to the Sega CD titles released to date varies greatly. Those using the world of video-game cartridges as their frame of reference are understandably impressed by the addition of video, digitized speech, and CD audio-quality music and sound effects. On the other end of the spectrum, those coming from the more sophisticated world of computer-based CD-ROM find it hard to get excited about the video quality — or the gaming appeal — of the early Sega CD products.

Sega's *Night Trap* is an excellent illustration. With a sales ratio of nearly one game per CD player sold, this is the

title most frequently used to show off the Sega CD. Even with more than 90 minutes of video footage encompassing two CDs, *Night Trap* falls far short of meeting the expectations of technology-savvy users.

Still, the sub-par video quality has not deterred the product-hungry Sega consumer. *Night Trap*, grainy images and all, is a major hit in spite of being one of the most boring video games ever released.

On a more positive note, some of the most engaging products among the early Sega CD releases are in the "Make Your Own Video" series, which allows you to experiment with a multimedia editing studio. These do-it-yourself MTV-like titles let users create and view their own video accompaniment for popular songs by selecting from a wide variety of footage and special effects. Initial titles in the series feature music from Kriss Kross, Marky Mark, and INXS.

In an interesting piece of high-tech recycling, several of the popular titles for the Sega CD were, in fact, converted from an earlier hardware system that never survived the development process. Both *Night Trap* and *Sherk Shark* were originally developed for Hasbro's I-Six, an ill-fated interactive video-tape game system that was deep-sixed after consuming millions of dollars in R & D. The initial concept for the Make Your Own Video Series also originated in the development process of I-Six.

Departure from Games

Sega, in an attempt to broaden its range of CD products to include educational and non-game titles, has announced the summer release of the "March of Time" series. This product lineup, more closely resembling a computer-based CD-ROM than anything to date on video-game systems, will feature documentary films originally produced by *Time* magazine in the '30s and '40s as newsreels for movie theaters and later expanded into educational films for schools.

The fact that Sega has so successfully positioned the Genesis as a great game console will likely inhibit, at least initially, the emergence of non-game titles for the system. As users become more aware of the increased potential of their CD-enhanced game system, a wide variety of educational and reference works can be expected to appear for the Genesis format. It's not going to happen overnight, but new educational titles should be available by Christmas.

The major concern for those investing in the Sega CD now is the lack of quality software — an inevitable position for every new hardware platform. Few of the early products released do justice to the hardware. The CD player adds a

second Motorola 68000 processor to the game system, giving it horsepower potential to dazzle the most critical player. At optimum performance levels, the Sega CD system should be one of the meanest, fastest machines on the proverbial road.

For the short term, all but the most easily pleased users will probably find themselves frustrated with both the quality and quantity of titles available. Within the software industry, the term *shovelware* is now frequently used to describe the wave of quick-and-dirty conversions from other platforms that invariably accompany a new hardware system to market. We're seeing that, and we'll see more in the months ahead.

One delightful exception is *The Adventures of Willy Beamish*. This Dynamix adventure game looks comfortably at home in its new Sega format, and most importantly, it even delivers several enhancements that improve upon the version enjoyed by owners of both the disk and CD-ROM versions for PCs. For instance, when in Willy's room, the Nintari game console on his floor is now a playable arcade game, reminiscent of the classic *Galaxian*. Unlike most of the other first-wave products, *Willy Beamish* compares favorably not only to other Sega titles, but holds its own against products on other more mature platforms.

Turbo Who?

The TurboDuo, the latest incarnation of the TurboGrafx-16, combines the original cartridge game system with a built-in CD player. It continues to offer an attractive price advantage, with the complete system selling for under \$300. The actual performance of the system is competitive, but suffers from a lack of third-party support that feeds the product pipeline for both Sega and Nintendo.

Last year, in an attempt to breathe some life into a faltering product, NEC and Hudson Soft aligned to create a new company, Turbo Technologies. Unfortunately, the passing of time and the introduction of a new model have done little to elevate this competent machine from its position as an also-ran.

Many parents underestimate the role that video games play in the kid-culture of the '90s. With school-yard social status often reflected in who has which game system and who has made it the farthest in the latest game, peer acceptance is a factor in the purchase of a new game system.

In this area, the TurboDuo remains a non-contender, at least when compared to the Super Nintendo and Sega Genesis. Without a broad base of developer support —

which doesn't seem likely to happen — and a major public relations face-lift, the TurboDuo is destined to the high-tech graveyard.

However, Turbo Technologies has announced The Intelligent Link, an interface that will allow the TurboDuo to serve a dual role — to be used as a CD player when hooked up to a PC, and to play as a CD video-

game system. This should prove attractive to PC owners with a limited budget. The Intelligent Link, however, could well be this system's last chance to establish itself. With a "sometime this fall" release date, we may be hearing the TurboDuo's last gasp.

And Where In The World Is...?

Nintendo remains noncommittal about its CD player, which has enjoyed the on-again, off-again status of a Ross Perot presidential campaign. The most recent rumblings from Nintendo hint that the company will continue to evaluate the market, and when the public is ready for CD-based games, Nintendo will then enter the ring.

While Nintendo has been deliberately laconic about its mysterious CD, a general picture is emerging via the rumor-mill. At this writing, the specs of the phantom Super NES ND (Nintendo Disc) include a 32-bit RISC processor running at 21 MHz and — according to persistent rumor — compatibility with Philips' CD-I machine.

Everyone acknowledges that Nintendo has the resources and know-how to deliver and successfully market a high-performance CD-based system. Yet while Nintendo still holds the largest share in the cartridge-based game arena, Sega, with its CD player, has enhanced its position in a leadership role — just as it did when introducing the 16-bit Sega well ahead of the Super NES. When it's released, Nintendo's CD unit will surely be welcomed by a waiting market; but once again, the perception in the marketplace will be that Nintendo is playing catch-up to its more aggressive competitor.

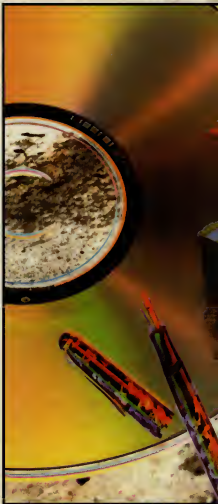


Turbo Technologies, a combined interest of NEC and Hudson Soft, has a competent machine in the TurboDuo — but faces tough-going in the Sega-Nintendo arena. The company is hoping that its Intelligent Link interface, allowing the TurboDuo to serve as a CD-ROM drive for PCs, will give the machine a boost when it arrives later this year.

A NEW SPIN ON LEARNING

Navigating Through Grolier's, Compton's, and Encarta

Multimedia Encyclopedias



RANDY CHASE

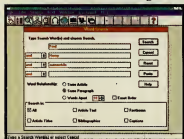
The great Library at Alexandria represented one of the first attempts to assemble the collective knowledge of civilization under one roof.

When the main library reached critical mass, overflowing with more than 500,000 scrolls, additional volumes were stored in an annex. Until its eventual destruction, this legendary library served as both the symbolic and literal storage center of global knowledge.

Almost two-thousand years later, we all have quick-and-easy access to huge bodies of accumulated knowledge via

government, school, and personal libraries. And for those with personal computers, an entirely new medium, with a unique mode of presentation that engages eye, ear, and mind, is now available. The new generation of electronic multimedia encyclopedias combines ten-million words with a stimulating collage of photographic images, video clips, colorful animations, digitized speech, and music clips. These dynamic products help to define for consumers the still somewhat fuzzy term "multimedia."

Until recently, Grolier's was the only player in the game, first appearing with its CD-ROM encyclopedia nearly ten years ago for the Atari ST. Prior to Microsoft's recent entre with *Encarta*, Grolier's only competition for market



Grolier's includes a four-level and/or/not Boolean word search that lets you pinpoint articles on a specific subject.



Encarta has the most intuitive interface of the three encyclopedias. A simple alphabetized bookshelf serves as the primary control.



Of the three encyclopedias, Compton's is the clear winner in the category of video-clips — they're used extensively.

retrieval process, with an easy-to-use interface that makes it attractive for young users, but *Grolier's* and *Encarta* offer greater flexibility. *Encarta's* stylish search menu offers the greatest combination of search options, allowing the expected Boolean searches for text occurrences, but filtering the results to include only those articles with sound and/or picture files attached to them.

Of the various approaches used to provide links between related articles, the simplest method is also the most powerful. While reading an article in *Grolier's*, you can click on a word and instantly see a list of entries containing the selected word. Clicking on a word in *Compton's* produces a decidedly different result: access to an on-line dictionary. While the dictionary is a nice feature, it isn't nearly as helpful as *Grolier's* click-and-find option.

A Time Line feature in both *Grolier's* and *Encarta* allows you to select items from a chronological list of major historical events and periods. *Grolier's* delivers a much more comprehensive list, but presents it in a sterile list of text. *Encarta* offers a smaller selection of topics, but augments the presentation with a colorful array of images, text, and pictures.

Both *Compton's* (MPC version) and *Encarta* utilize Write, Windows' mini-word processor, to facilitate note-taking and copying of highlighted text into a research document. The omission of such a facility in *Grolier's* is an inconvenience that should be

only *Compton's* appears somewhat sluggish in this critical performance test. *Compton's* offers both the simplest and most awkward



A quick click on the camera icon retrieves the cross-referenced photograph in Grolier's.

corrected in the next upgrade.

The recent promotional campaign by *Compton's* New Media highlights the Virtual Workspace interface, a late 1992 addition to the product. Navigating the enormous workspace represented by a small on-screen map may be intimidating at first to the casual user, but once mastered, offers the most flexible and productive working environment of the three packages.

Similar to a large desktop environment, Virtual Workspace lets you open and arrange more information-filled windows than the screen will hold. Once Virtual Workspace is appropriately busy with a relevant collection of opened windows, you can save the collage and return later to continue work with the same arrangement and access to data.

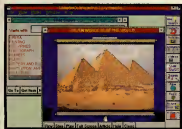
Grolier's and *Encarta* both use a more traditional method of marking articles, images, and sounds of interest. By adding a bookmark, your current location is recorded for later (and quick) access. The personalized bookmark list is a mouse-click away, with any "marked" position available for

selection. This bookmark approach doesn't have the dynamics of *Compton's* Virtual Workspace, but it is simple to use, allowing young children to master it in minutes.

Encarta includes a unique feature: Mind Maze, a colorful and light-hearted trivia game, leads the player on a journey through an informational museum. Each room is a collection of objects, pictures, and displays, each providing some interesting tidbit of information with a prompt that



Mind Maze, a unique feature of Encarta, is a trivia game that takes you through an informational museum.



Some of the best features in Compton's are the multimedia slide shows.

allows direct access to the related article in the encyclopedia. Advancing to the next room requires a correct response to a multiple-choice trivia question.

The Data Derby

Judging by the pound, *Grolier's* holds the advantage in sheer bulk of information. Invariably, someone — perhaps the publishers — will create comparison charts touting the number of words, images, and maps in each collection, but there really isn't any significant difference here between the three. A series of test searches resulted in comparable responses, each providing enough information to satisfy most users.

A search for references to "Gettysburg" resulted in 41 articles in *Grolier's*, 28 in *Encarta*, and 26 in *Compton's*. Simply searching for a single word can deliver a wide range of both informative and trivial information. *Compton's* indexed list for Gettysburg included an entry for the Studebaker Brothers, who lived in Gettysburg. *Encarta* countered with a biography of Gettysburg native and Hall of Fame pitcher Eddie Plank.

A request for information on the Iroquois Indians resulted in 77 topics in *Encarta*, 66 in *Grolier's*, and 26 in *Compton's*. On this subject, *Encarta* responded with the widest range of cross-referenced articles, including articles on women's rights and military history (tracing the unique role of women in Iroquois society, and in the tribe's development of non-metal armor). *Encarta's* primary article on the Iroquois also featured a splendid black-and-white photograph of an Iroquois mask.

One of the more striking contrasts between the three products is the treatment of

images. While *Compton's* boasts thousands of more images than *Encarta*, approximately 70 percent of the images in *Encarta* are full color, compared to about 45 percent for the competition. *Compton's* leads in total images, totaling 12,000. *Encarta* offers about 7,000 and *Grolier's* approximately 4,000.

The most dramatic visual difference, however, is revealed when you expand images to full size. Both *Grolier's* and *Compton's* suffer from the grainy texture you normally get when enlarging graphics. Microsoft, not concerned with supporting DOS or Macintosh formats with its disc, solves the problem by including separate large and small versions of the images. This simple, but effective, solution

results in colorful, full-screen displays in high resolution — here, *Encarta* outshines the competition.

In the world of information disbursement, the most current product always holds an advantage in timeliness. Accordingly, if you're wanting to listen to Bill Clinton's election night



Encarta's emphasis on pop culture includes photographs and biographies of Bruce Springsteen and Madonna.

speech in Little Rock, you'll have to spin the *Encarta* disc.

Another subtle personality trait that defines the contemporary feel of *Encarta* is its stronger emphasis on pop culture. Entries, with large dramatic color screens, are included for Bruce Springsteen and Madonna. A short audio clip of Creedence Clearwater

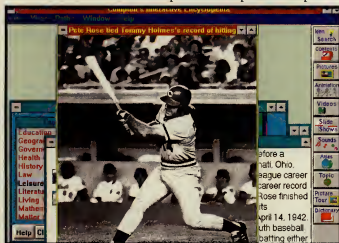
Revival performing "Fortunate Son" is included. Granted, this might not score many points with some high-school history teachers, but it gives *Encarta* a chic persona, and adds an element of excitement that, to many, fits the idea of a 1990s multimedia encyclopedia.



History students can watch a video clip of Richard Nixon's famous farewell speech in Grolier's.

Promise and Fulfillment

Collectively, all three encyclopedias present some of the best multimedia drama in contemporary CD-ROM technology. For more than a dozen years, we've heard the promise about personal computers



Historical events, such as this example from Compton's, come to life with dramatic images.

enriching the educational experience. These products do more to fulfill that promise than anything else delivered to date.

Just as importantly, especially for those wishing to see the CD replace the floppy disk as the dominant software-delivery method, these products have the power to motivate consumers to begin the hardware migration to CD-ROM technology. Few parents, after seeing any one of these dynamic and entertaining encyclopedias, will want to invest in the bookshelf variety.

For the consumer, comparative shopping will likely be both difficult and delightful. The gauntlet of features in these products offers a staggering variety of comparisons to try to sort through. Fortunately, it's a no-lose situation — any one of the three will reward the user with a seemingly bottomless well of educational information that will stimulate the mind and engage the senses.

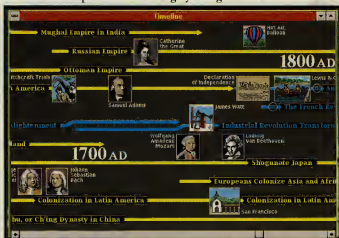
Compton's is an attractive package, targeted to a slightly younger user. Its strengths: extensive use of video clips and a handsome interface that's a full generation ahead of Grolier's. Encarta takes the cosmetics a full step further, thus stealing this advantage from Compton's. Grolier's greatest strengths are in its sheer quantity of information and in the impressive depth of indexing developed during its tenure in

the market. Its greatest weakness is a tired look that hasn't evolved significantly over time. A face-lift is promised later this year, but until that happens, buyers may be drawn to the competition.

Propelled by the stylish simplicity of the interface, a Microsoft trademark, the winner at this point is Encarta. An elegant design with a strong emphasis on overall graphic appeal makes the difference.

Encarta's most glaring weakness is its sparse use of video. According to Encarta project manager, Sonya Gustafson, Microsoft doesn't believe that the current quality of computer video technology will truly satisfy the consumer, and accordingly, Microsoft has elected not to emphasize this feature to the same degree as the competition. However, any user who has witnessed Compton's dramatic video footage of a space shuttle launch or the crystal-clear imagery of whales swimming in the ocean won't necessarily agree.

Although Encarta will undoubtedly challenge for the leading position in the multimedia encyclopedia market, both Compton's New Media and Grolier's will reap benefits in a category now given



added legitimacy by Microsoft's entry.

Encarta's Time Line presents a colorful mural of the chronology of history.

The ultimate winner here is the consumer looking for CD-ROM products with sophistication and practicality, something the software industry has been aiming toward for years. Together, these three products offer some of the most graceful and mature implementation of computer software technology to date.



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C I N E M A T I C R O M M U L T I M E D I A

FONtasia!



CD-ROM font collections come in every size, shape, and flavor — and in prices ranging from \$30 to \$4000. Here's what to look for, how to buy, and what's available.

George Campbell

Whether you work in DOS, Windows, or on a Mac, there are more available tools now for creating attractive, attention-getting documents. A well-selected font can punch up even the most mundane memo or letter. With a CD-ROM font collection, you can access hundreds of typefaces, ranging from simple to decorative.

Your biggest problem is a happy one. There's such a range of CD-ROM font collections that it's tough to decide which one to buy. We'll take a look at what you need to consider before purchasing, and then review a variety of collections now available.

The Type-Selection Dilemma

The old days of fixed-size fonts and dot-matrix printers are long gone, replaced by the new world of scalable fonts and laser printers. While Mac users have always had access to scalable fonts and WYSIWYG displays, the PC community only recently moved into that arena. Two font-scaling technologies exist for both platforms, and that's the starting point in your selection process.

PostScript, the elder statesman of the scalable font world, is the de facto standard of font technology. Supported by hundreds of printers for both PC and Mac platforms, PostScript fonts also find broad acceptance in the world of third-party typesetting services. If you use a PostScript printer, or normally send your finished documents out to a typesetting service, you'll probably choose PostScript fonts, whatever the source. Used with *Adobe Type Manager* for Windows or the Mac, Postscript outlines exist for thousands of typefaces, and are available from many suppliers.

But PostScript isn't the only scalable font choice: TrueType font technology is gaining fast acceptance. Since both Mac and Windows platforms support scalable TrueType fonts, which allow display and printing on all graphics-capable printers, many users are going this way. If your output goes primarily to a non-PostScript laser printer (or even a dot-matrix or inkjet printer), TrueType offers somewhat faster printing, along with a rapidly growing selection of high-quality typefaces. Most font companies now offer their fonts in both formats.

So which do you choose? In most cases, you can use both types on the same machine, with programs like *Adobe Type Manager* acting as a go-between to let you use whatever fonts you

want. Still, if you send your documents out for typesetting, you'll probably want to stick with PostScript for now. Many typesetting services are adding TrueType support, though, so check with your service bureau.

Finally, even DOS users now have scalable font options. Programs like MicroLogic's *TrueType for DOS* offer TrueType support for character-based word processors like *WordPerfect* and *Microsoft Word*.

What Price Fancy Text?

One of the first things you'll notice when looking for new fonts is the wide range of quality and cost. It's like the difference between a brand new Rolls-Royce and a ten-year-old Volkswagen. You can pay as little as five cents for a scalable TrueType font in some collections, or as much as \$50 in another. Like the old car, the cheap fonts will get you there, but not with as much style as the Rolls-like high-end fonts. What's the difference?

First, most of the cheapest fonts are knockoffs or barely legal copies of the expensive fonts. Font-conversion and editing software allows easy alteration of a font from one format to another. It's all legal, in a way, since a font can't be protected by copyright laws; only the name of the font can be given a copyright. That leaves the field open for people to copy fonts to new formats, rename them, and sell them as entirely new products. That's where many inexpensive fonts originate. The legality is under question, but these fonts are available, and you needn't worry about your legal right to use them.

Another source of inexpensive fonts is from font designers who sell their fonts as shareware. They design new fonts, make them available for you to try, then ask you to pay a modest fee if you use them.

As you might expect, cheap fonts vary widely in quality, depending on the utility used to create them and the skill of the person who made the design or converted the font. In some cases, fonts in this low-end category can even cause your system to crash, and many are missing some foreign-language and symbol characters. In defense of these fonts, though, some offer typefaces not available from any other source. Some inexpensive fonts are even made up of graphic images, turning the font into a clip-art source.

At the other end of the scale are the high-quality fonts in the more expensive collections. These fonts always run perfectly on your computer, contain complete character sets, and offer extensive hinting and sets of kerning pairs (see "Glossary" sidebar). In addition, you'll usually find a full set of weights in most font families, something missing in most inexpensive fonts, along with extensive hinting to compensate for different font sizes. Since

these fonts are original designs, rather than converted copies, you get the maximum font quality possible.

So how do you decide? What many casual users do is purchase the fonts they use the most from the more costly group to take advantage of the higher quality and wider variety of weights in each family. Then, for decorative fonts, dingbat collections, and other fonts used for special purposes, they use a collection of less-expensive fonts. While a full collection of high-quality fonts can cost thousands of dollars, a basic set of high-end fonts, combined with an assortment of inexpensive fonts makes a good mix for casual users. Professionals, of course, need the highest quality possible. If you make your living with fonts, you'll want to use the best you can get.

A Three-Way Race

There are three basic types of CD-ROM font collections. First, and most expensive, are *locked* professional font collections, like Adobe's *Type on Call*, and BitStream's *Type Treasury*. With these collections, you purchase the CD, with a few of the fonts unlocked, for a reasonable amount of money. Then, when you need additional fonts, you contact the publisher and pay a fee for each individual font you want to use. You then get a code that unlocks the desired font.

Unlocked professional font collections make up the second category. In these collections, all the fonts are available for immediate installation. Ranging in price from \$499 to almost \$4000, they include high-quality font outlines, all ready-to-use. While the initial cost is higher, you get more fonts for your money. B&P Graphics' *Serials II* collection, for example, contains 1000 font outlines, and costs \$499, making the cost of an individual font outline just 50 cents. Still, few users need 1000 different fonts, so the cost of the fonts you actually use is higher. In most cases, you can also purchase unlocked versions of the locked CDs mentioned above, but the cost is high.

Finally, there are collections of inexpensive freeware or shareware fonts. Most often these are available in PostScript or TrueType formats, mainly for DOS and Windows users. Costs per outline in these collections are extremely low, ranging downward to about ten cents per outline. You get lower quality, and some fonts may not even work in your application, but you'll also find fonts (especially decorative, dingbat, and pictorial) unavailable anywhere else.

Note that address and phone-number information for the companies listed below are found in the Directory, elsewhere in this issue.

leaf set of type specimens. Since all fonts are unlocked, you need only your platform's font installation tools to access any typeface. Font file names, however, are confusing at times, complicating installation. You get installation tools on the CD, but they're only for the PostScript fonts. You're better off using your system's built-in installation tools.

CastCraft Optifont CD Volume 1

Available for both Mac and PC, this unlocked CD offers 400 well-designed fonts in both PostScript and TrueType formats. Like most unlocked font collections, you'll have to cope with unfamiliar font names, but cross-reference lists help you match up names like Brian James to its equivalent Benguiat in other collections. A type booklet gives brief samples of the fonts included. While its \$996 price is higher than the B&P collection, it still works out to less than \$2.50 per font, and the fonts include extensive kerning pair tables.

Image Club Graphics LetterPress 2.0

On the high end of the price range for unlocked CD-ROM collections, Image Club's \$3995 disc offers 626 fonts for both Mac and PC. All fonts are in PostScript Type 1 format, although the company is working on a version with TrueType fonts. You also get outlines in CorelDraw format for the PC and in Illustrator and Fontographer format for the Mac. The sample clip-art and logo collections add value to the package. A poster shows the available typefaces, but there's no preview utility on the CD. At about \$6.50 per font, you pay a bit more in this collection, but the fonts are of high quality and come from major font foundries.

Swfte Typecase

If you're looking for a bargain, check out this \$69.95 collection of TrueType fonts from Swfte International. It holds over 230 fonts for Windows users, and comes with a clever utility that lets you install several sets of fonts in different typecases to better organize your font library. You're also able to preview fonts before installing them, something rare in these collections. By using only the fonts you need at any time in Windows, you'll get faster performance. Another plus is the addition of fonts for PC keycaps and international icons. Fonts are of good quality, although not quite as impressive as the more expensive commercial collections. For most uses, however, you'll be happy with these fonts.

Freeware and Shareware Font Collections

Too Many TypeFonts

Selling for just \$29.95, with most dealers charging less, this PC-only collection from Chestnut CD-ROM offers almost 400



Too Many TypeFonts includes fonts you won't find in commercial collections, such as this TrueType font for Windows containing images of food items.

you locate the files you want, and will even move the files from the CD-ROM to your hard drive for easier installation. Font quality varies widely here, and a few don't work at all, but the variety is extraordinary. You'll find scores of interesting display fonts, plus dingbat collections and even some clip-art style fonts, such as fonts with pictures of food items or animals. Even if you only use a few specialized fonts from this collection, its low price makes it a bargain. Chestnut CD-ROM doesn't sell directly to users, but can offer names of dealers near you.

Just Fonts

From Save On Software comes this \$49 collection of 350+ Post-

Script Type 1 and TrueType fonts for Windows users. Most are decorative or display fonts, but all are useful and interesting. You'll find both free and shareware fonts on the CD, and a viewing and installation program make picking and installing fonts simple. In addition, a collection of .GIF files lets you see previews of the fonts before you install them. Windows Write files contain

printable font samples. Since the fonts don't come from commercial foundries, you're likely to find some fonts with incomplete character sets. Still, at this price, you probably won't be disappointed.

PostScript, and more than 500 TrueType fonts, plus assorted fonts for dot-matrix printers, HP LaserJets, and for applications like First Publisher. You'll also find a number of shareware utilities to help you use your fonts. A built-in utility helps

you locate the files you want, and will even move the files from the CD-ROM to your hard drive for easier installation. Font quality

varies widely here, and a few don't work at all, but the variety is extraordinary. You'll find scores of interesting display fonts, plus dingbat collections and even some clip-art style fonts, such as fonts with pictures of food items or animals. Even if you only use a few specialized fonts from this collection, its low price makes it a bargain. Chestnut CD-ROM doesn't sell directly to users, but can offer names of dealers near you.



Just Fonts includes GIF preview files for every TrueType or PostScript font on the CD, even unusual ones like this, making it easy to find the font you want.





Two on the Aisle

What self-respecting movie buff doesn't have an overloaded bookshelf, probably close to the VCR, weighted down with a library of essential reference works like *Movies on TV and Videocassette*, *The Official Splatter Movie Guide*, and *Video Trash and Treasures*? My own favorite, *Video Hound's Golden Movie Retriever*, is now the size of telephone book.

Thanks to two recent CD-ROM releases, some of the best movie reviews, information, and cinema trivia are only a mouse-click away. Roger Ebert, slightly more than half of TV's favorite odd couple, has compiled a cumulative edition of his annual *Movie Home Companion*, while Microsoft has entered the market with an even more ambitious omnibus project, appropriately titled *Cinemania*.

Microsoft's multimedia compendium includes all 19,000 capsule reviews from Leonard Maltin's *Movie and Video Guide*

Cinemania and Roger Ebert's Movie Home Companion

David A. Wade

(1992 edition), covering a full range of films from 1914 to late 1991, plus impressively in-depth essays on several hundred classic and contemporary films selected from *The Motion Picture Guide*. And if you've ever wondered precisely what contribution a "color timer" or a "Foley editor" makes to a movie, these and hundreds of other specialized film-making terms are all clearly

explained in the Glossary section. You can research every aspect of the movie-makers' craft, cinema history, and even dip your toe into critical theory through the thousands of substantial entries culled from the *Baseline Encyclopedia of Film*.

Cinemania offers nearly 3000 biographies/filmographies of the best-known actors and directors. Many of these are illustrated with excellent portraits—the black-and-white photos on this disc seem to glow! Also included in *Cinemania* is a gallery of film stills depicting memorable moments from some favorite movies, 100 of which are accompanied by a short sound bite of key dialogue. True fans can hear Gable tell Leigh that he doesn't "give a damn" about her, or Bogart toast Bergman with "Here's looking at you, kid," as often as they like.

To help you navigate through this fascinating maze of text, images, and sound excerpts, *Cinemania* features an ingenious visual device, an on-screen "remote control,"

not unlike the push-button device you already use for your VCR/TV. This allows you access to the full index of films, names, and subjects, or any filtered subset thereof, and to flip between career surveys and filmographies, display pictures, and switch on sound.

Hypertext links allow you to pursue endless threads of curiosity. Let's say there's your going to be a late-night screening in your area of the Jeff Bridges/James Woods 1984 thriller *Against All Odds*. You scan Leonard Maltin's thumbnail review and discover it's a remake of a film noir classic, *Out of the Past*. After checking the definition of "film noir" in a superimposed box, you jump back to the review of Jacques Tourneur's original film, and this in turn prompts you to check out Robert Mitchum's biography. Your attention is drawn to the 1975 Mitchum version of *Farewell, My Lovely*. You digress just long enough to jot the film title down in the ListMaker (to take with you later in the video store) before doubling back to check on the first film version of that Chandler story, titled *Murder, My Sweet*. There's an evocative still of Dick Powell explaining to Claire Trevor: "The cops always like to solve murders done with my gun." And from there... well, by now you've got the idea. This disc should carry a warning label: Highly Addictive.

For couch potatoes everywhere, *Cinemania* is a moveable feast. It's the kind of disc most of us hoped would be published when we first bought our CD-ROM drives. However, although this compilation is highly commendable for a first-time effort, it's not without certain shortcomings. It should be noted that there are no actual movie clips included — some stills, yes, and a few sound snippets (by the way, *The Godfather* extract isn't even Brando), but there are absolutely



Cinemania includes nearly 3000 biographies/filmographies of actors and directors, as well as a gallery of film stills from some favorite movies, some of which contain sound bites.

no film excerpts.

Also, *Cinemania* is based on long-established reference works which, not surprisingly, favor cinema over the burgeoning video scene. You won't find biographical backgrounders on cult faves like Wings Hauser or scream-queen Linnea Quigley. But, even given that bias, the portrait gallery is very much a pot-luck collection; for example, there's a picture of French auteur Jean-Luc Godard, but no visual references for legendary American producer David O. Selznick or maverick director Sam Peckinpah.

The ListMaker is annoyingly limited in operation, with only crude printing facilities. And then there are the occasional errors....

Before spending time with *Ebert's Movie Home Companion*, I decided to check *Cinemania's* entry on Ebert himself. Push the button for Biographies, set the filter for Critics, and — presto! — there's "Ebert, Roger." Not once, but twice, the brief biography insists he was born in 1962. If true, this would have made him all of eight years old when he wrote the screenplay for Russ Meyer's camp masterpiece *Beyond the Valley of the Dolls*, and only 13 when he received the Pulitzer Prize for his work as a film reviewer. However talented Ebert might be, surely he was not that precocious.

Ebert's Movie Home Companion, from Quanta Press, has none of the glitz of *Cinemania*; in fact, it has only one big plus, and rather a lot of small minuses. The big plus is, of course, Ebert's writing. The disc

film-going. This is film reviewing at its most entertaining and informative — Ebert passes the acid test of still being interesting to read even when one completely disagrees with him.

Capsule comments have room only for a phrase or two of huffy moralizing; Ebert, on the other hand, takes all the space he needs to explain why he won't subscribe to the critical adulation surrounding David Lynch's *Blue Velvet*. And even veteran fans of Orson Welles' work will learn something from the special guide to viewing the immortal *Citizen Kane*. And you'd have to be totally humorless (a Hollywood producer, maybe?) not to find the tongue-in-cheek *Glossary of Movie Terms* hilarious. So far, so good. Unfortunately, all these text pieces are tied together with the Folio front end, a decidedly unglamorous search engine (you may have encountered it on *Magazine Rack* or some other CD-ROM), appropriate perhaps for an industrial-strength database, but hardly the most elegant tool for indexing what is really a single volume of short articles.

The hypertext links are sparse when compared to *Cinemania's* network of leads. And there's no supplementary material such as stills, film clips, or reference lists. It's difficult to see what advantage there is to buying the disc rather than having the book to browse through at a moment's notice.

For the pleasure of Roger Ebert's text alone, *Movie Home Companion* rates two-and-a-half thumbs out of five. *Cinemania*, despite a few flaws, gets four thumbs.





A Bang for Your Buck!

You can never have enough software! Whether you believe that or not, a number of CD-ROM publishers have taken the concept to heart. Slip one of their discs into your CD-ROM drive, and you're in the heart of a software store with thousands of programs on the shelf.

But it's not an ordinary software store. The programs on these CD-ROMs are different from the shrink-wrapped software you'll find at a local retailer. Some are completely free (freeware), and others are shareware.

While you may never want to use shareware or freeware to replace your word processor, database, or spreadsheet, there are shareware programs available to do just about anything you could think of on your PC. Thousands of these programs are top quality, and written by talented programmers. Finding them, though, can be a real chore.

Shareware on CD-ROM

George Campbell

Shareware Sources

Traditionally, the main sources of shareware have been private and public BBS's, and online services such as CompuServe and GENie. After searching the services' directories, you download those programs you want to try. After adding long-distance charges and online fees to the time needed to locate just the program you need, finding the perfect program for your needs can be expensive.

Another popular source of shareware is through mail-order distributors. These companies offer catalogs of programs,

typically priced under \$5 per disk. After searching through catalog descriptions, you order the disks you want, then wait a few days before you can try the program. If the program you ordered turns out not to do the job, you get to start all over again.

Your CD-ROM drive can solve all of the problems traditionally associated with finding shareware programs. With a single CD-ROM shareware collection, you have instant access to many thousands of programs. It's like having an online service available around the clock, but with no online charges. The CD-ROMs described below contain a wealth of software. Most have an easy-to-use interface that lets you find the programs you want, then helps you install them. If you're not happy with one program, you can simply try another.

What You Get

While these collections vary in several ways, you'll usually find every software

category represented. Business users can find word processors, spreadsheets, databases, accounting programs, and even programs designed for specific businesses, such as auto-repair shops. Consultants will discover sophisticated contact-management software, personal-information managers, plus time and billing programs.

For teachers, there are gradebook programs and educational software supplements to the school curriculum. Parents, too, can find educational offerings, as well as household management and home-budget programs, and, yes, recipe managers. For kids (even grown-up kids), most discs include a cornucopia of games, ranging from simple text adventures to full-scale arcade games.

If you need clip-art images, you'll find them in quantity, in just about every possible graphics format, plus programs you can use to create your own art. Windows users, too, will find a wide choice of programs, fonts, sound files, graphics, and more. In fact, no matter what your interest or activity, you'll find plenty to look at and try. Your biggest problem may be finding enough time to try everything.

How good are these programs?

Unlike most titles in the commercial retail market, the quality of shareware varies quite widely. You'll find shareware written by beginning programmers, but you'll also find programs that match the quality of top commercial offerings. Most CD-ROM shareware publishers have screened the tens of thousands of available programs to include only the best of the best on their CDs, but there's still some dross. Fortunately, you can simply ignore a program that doesn't do the job. There's sure to be a better one on the CD.

Making A Choice

If you have a CD-ROM drive, a shareware collection is a must. The cost per program

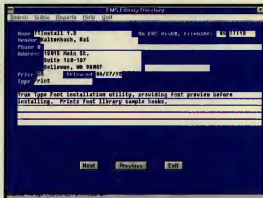
is so low that you'll repay your initial expense the first time you use a program.

You'll want a collection with the widest possible variety of files, unless you have very specific needs. Any collection you buy should be up-to-date, with recent versions of all programs. Old versions of shareware and public domain programs may be worthless. Also, you'll want a collection that makes it easy to find the program you need. With hundreds of megabytes of files, locating a particular program can be impossible without a well-organized search routine.

With the number of available products growing almost monthly, it's tough deciding which collection to purchase. You'll find ads in most computer magazines for these collections, at prices ranging from almost nothing to around \$200. To help you get a handle on what's out there, we looked at a variety of available collections. For publisher addresses and phone numbers, see the Directory, elsewhere in this issue.

EMS Professional Software

EMS offers a unique marketing system for its CD. For \$59.50, you can purchase a



EMS Professional Software

single library of software for a specific category, such as multimedia, games, small business, or, for \$195, you can buy the CD containing all the libraries. Why the difference in price if you get everything by buying one library? Only the

programs are on these discs; the directories and search software come on floppies.

This collection is priced a bit higher than some others, but the programs here are the most recent of any collection in this review. In addition, the programs are carefully selected, and there's no scrimping in content. For example, the TrueType directory holds almost 750 fonts, making it competitive with some of the commercial font-only CD-ROMs. You'll find everything here from games and DOS utilities to Windows programs and programming tools for most popular languages. Having to install the database information on your hard drive is less convenient than having it all on the CD-ROM, but the timeliness and professional quality of these programs make this collection worth checking out.

PC-SIG CD-ROM, Twelfth Edition

PC-SIG is the grandfather of all mail-order shareware distributors, and was the first to issue a CD-ROM collection of all programs in its catalog. Now in its twelfth edition, it remains one of the best. Selling for \$99, the PC-SIG CD-ROM holds one

of the most contemporary collections of files available anywhere, which more than makes up for its higher price. All programs are tested by the PC-SIG reviewers, so there's little dross among the gold here.

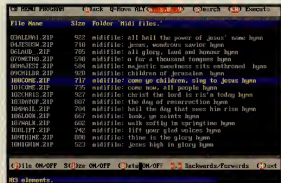
You'll find DOS and Windows programs galore here, all managed by an interface that makes it easy to find what you want. If there's any

drawback to this CD, it's that PC-SIG is so selective — the disc doesn't have nearly the quantity of files available on Crosley's four-disc Shareware Extravaganza, but there's more than enough. If you'd like to specialize even further, PC-SIG also offers a Games CD for \$25 and The Essential Home and

Business Collection for \$39. More specialized collections are in the works.

Shareware Extravaganza

Priced at \$89, this collection from Crosley



Shareware Extravaganza

Software may be the ultimate — filling up four discs, it contains over 25,000 programs! Disc 1 offers games, music, and graphics programs. Games range from talking educational programs to arcade games and flight simulators. Graphics software includes paint programs, images, and animated mini-movies. The music section includes music files for Sound Blaster cards and a broad collection of MIDI files, plus programs for creating your own music. Disc 2 offers database software, more educational programs, desktop publishing utilities and clip art, programs for amateur-radio operators, communications programs, and programming utilities.

Disc 3 is dedicated to utilities of all kinds, plus networking, virus protection, more clip art, and spreadsheets. You'll also find home-related programs on this disc. Finally, Disc 4 offers more games and music, plus several CAD programs and a large collection of Windows software and utilities. Files are current, for the most part, with plenty of 1992 and 1993 dates. Full-featured search tools help you quickly find the programs you need. Also included is a handy feature that lets you temporarily install any program, run it, then automatically delete it if you decide

not to keep it on your hard disk.

If there's any criticism with this collection, it's that there's just too much software in it. Four discs and 25,000 programs can boggle the mind, but it's a happy boggling. This is the most extensive collection available anywhere, but it may take longer for you to find the exact program or file you want. On the other hand, the enormous variety helps insure that the program you want will be here.

Shareware Overload

This \$29.95 CD-ROM collection from Chestnut Software was published in 1992, and offers a wide variety of programs across many categories. On its single disc, you'll find business-related programs, communications software, games galore, plus utilities, educational, and financial software.

There's a substantial section of Windows programs, an extensive clip-art collection, plus music software, and even the entire Bible, complete with search tools.

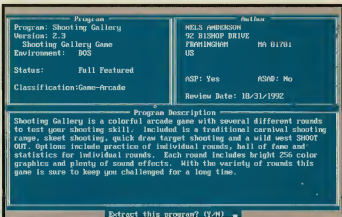
A utility for locating programs on the disc is included, but it's limited to one-line descriptions. Since all files are in compressed ZIP format and there's no automated system for copying files, it can be difficult at times to get the files from the disc to your hard drive for testing.

The biggest problem with this collection, though, is its age. The Windows programs are mostly written for version 3.0. Most will run under 3.1, but many of the programs have been updated at least once since the disc was issued. Still, the cost for the disc is very low, and

it may be worth a purchase just for its excellent clip art and music file collections. Chestnut doesn't sell directly to users, but can refer you to a dealer in your area.

Shareware Sampler

Here's a novel CD-ROM. It contains an assortment of DOS and Windows programs, both freeware and shareware, and includes a mini-database you install on your hard disk. You can use this database to search the disc for programs you want to try, then automatically move them to your hard drive. In that, it's much like the other collections. But there's a difference: This disc is essentially free. For a \$6 shipping and handling charge, you get the disc with its hundreds of programs. Sure, there's a hook: JCS Marketing, the publisher of this collection, is offering a shareware collection



Shareware Sampler

subscription service. For \$19.95, you get the first issue, a single CD containing 400-500 megabytes of shareware and public domain software. A \$49.95 subscription will bring you the next three issues. Currently, JCS plans to move to multiple discs for future issues.

The programs on the sampler are mainly DOS programs, with a sprinkling of Windows files, and the CD is more than worth the \$6 shipping and handling fee. Due to the short production cycle of a

subscription-type of service, you can expect future issues to offer only up-to-date program versions.

So Much Shareware Two

Priced at \$69, this disc from Power User Software is an up-to-date collection of home-and-business software, games, programs from A to Z for both DOS and Windows, plus tons of clip-art images, music files and over 200 PostScript Type 1 and TrueType fonts for Windows users. You'll also find plenty of utilities, and even programming aids. A mouse-driven interface lets you move programs to your hard drive, or just lets you look inside the archive to examine the files. Unfortunately, though, there are no search tools to cut down on the time needed to find just the program you want. The fact that the programs are up-to-date makes this disc a good bet, even if it's not at big as the multi-disc collections.

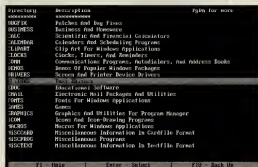
The Ultimate Shareware Collection

Containing about 1700 separate programs and files, this CD from Save On Software includes an effective search utility, and offers excellent descriptions of the programs on the disc. Once you find a program you want to try, the software expands the archive file onto your hard disk. You'll find business-related programs, games,

graphics programs, and educational software, plus utilities and a small collection of Windows programs. Most programs have 1991 and early 1992 dates, so this \$59 collection isn't as up-to-date as some others. The search program is first-rate and easy to use, and the collection is well-organized. Updates are planned for this disc, and a second volume is in the works.

Windowware

If you use Windows, this \$29.95 CD-ROM collection is a good choice. An entire disc devoted to the Windows



Windowware

environment, Chestnut Software's *Windowware* includes hundreds of megabytes of programs spanning all categories. Ranging from business and productivity applications to games, graphics, and utilities, you're likely to find a large number of programs to suit your needs. In addition, there's a large collection of fonts in both the PostScript

Type 1 format for *Adobe Type Manager* users and in the native Windows 3.1 TrueType format. Finally, updated drivers for many printers and video cards are available on the disc.

Since the disc was mastered in 1993, most programs are quite up to date. The interface software, unlike the one used in Chestnut's

Overload collection, includes search tools, and can install programs on your hard drive.

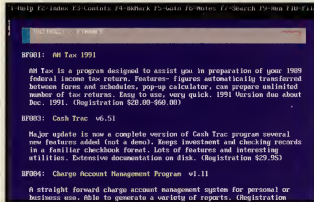
World Vision

This \$59 three-disc set from Power User Software offers thousands of shareware and public domain files, ranging from games and business applications to clip art, music, and Windows applications. There are plenty of TrueType and PostScript fonts included. Essentially, you'll find just about anything you might want on this disc. The built-in access software allows copying to the hard disk and unzipping of archive files, but has no search tools.

The only drawback to this collection is that there's plenty of duplication, with some programs appearing in several different versions on the CD. That can make the job of finding just the program you need a bit more difficult, but file dates at least give you a head start. Dates range from 1987 through the first half of 1992, so the usefulness of some files is in question. Like the *Shareware Extravaganza* collection, there's more to look at in this low-priced collection than you'll probably ever have time for, but if you want a huge collection, take a look at this one.

Other Collections

There are dozens of other shareware collections in CD-ROM format, and more are emerging almost weekly. Here are several more vendors offering CD-ROM shareware collections that you'll want to check out: Quanta Press, Pier 1 Exchange, Walnut Creek CD-ROM, Profit Press, The MARKETplace, and Starware Publishing. For addresses and phone numbers, see the Directory, elsewhere in this issue.



The Ultimate Shareware Collection



Getting the Picture

Clip Art on CD-ROM

George Campbell

Picture This

While a number of clip-art suppliers are still working with floppy disks, the trend is rapidly moving to CD-ROM distribution, so your choices are increasing almost monthly. The variety among the collections is so wide that you'll need to know what you're getting before you buy. Here are some points to consider before making a purchase.

•*Determine the types of images you need.* If you're working with a black-and-white printer, don't spend your money on glorious color images; they

don't reproduce all that well when converted to black and white. But if you've moved up to a color printer, or use a service bureau to produce color masters, you'll definitely want to look for colorful collections.

•*Be sure the images on the discs match your platform.* If you're using a Mac and a PostScript printer, images in the EPS (Encapsulated PostScript) format make the most sense. Similarly, PC users working primarily with PostScript output may also opt for the EPS format. For more general use, or for collections to be used on multiple platforms, opt for the popular TIFF or PCX formats. Just about all software can accept these images on either the Mac or PC.

Other formats you may find include GIF and PICT images. PC users should avoid the PICT format, which is designed for Mac users, and GIF images, designed primarily for screen display, may have to

If that old adage about a picture being worth a thousand words is true, then your CD-ROM drive gives you a special advantage over other computer users. Clip art you can use to enhance any document is available on a wide variety of CD-ROM collections for both the PC and Mac environments.

Before CD-ROM clip-art collections were available, assembling a collection of images was costly, both in terms of cash and, even more importantly, in hard-disk space requirements. Floppy disk-based clip-art collections could clog your hard drive with hundreds of images, leaving little room for other files.

Thanks to the CD-ROM format, you can find clip-art collections with hundreds or even thousands of images in whatever format you need. And there's no need to move the images to your hard disk at all, unless you'll use a particular image again and again.

be converted to other formats before you can use them. Also, if you plan to alter these images, you'll want to get a collection in the format used by your favorite graphics editor.

• *The collection you buy should include clip-art images you'll actually use.* A collection of U.S. government official seals isn't going to be of much use unless you create documents for government agencies, but it could be the only clip-art collection some users might need. Choose your collection based on the work you do.

• *Think about the sizes of the images in your collection.* A collection of full-page images isn't going to work well for you if you're designing business cards. While you can scale pictures in your software, there's almost always some image degradation when you resize an image heavily. So go for the collections that suit your projects.

Reproductive Rights

Many users think that buying a collection of clip-art images entitles them to free use of these images. This isn't always the case. Some of the collections covered here are in the public domain, meaning that you can use the images any way you wish, including reselling the images themselves. Other images are protected by copyright, and your rights to use them are limited by the license agreement.

In most cases, these collections allow you to use the images in your documents and to send those documents to anyone you like. But you can't sell the images themselves in any form. That's the most common license restriction, and it applies to most clip-art collections. But there's still another license restriction that applies to a few collections reviewed here. Some suppliers allow you to use the images in internal documents, but require you to pay additional license fees if you use the images in advertising or other commercial applications.

The bottom line: Carefully read the license agreements for the collections you buy. If you inadvertently use an image in a way that violates the agreement, you could be faced with legal action.

In a few collections, comprised of images gathered from bulletin boards and other public sources, the publisher of the collection is merely passing along images from a number of sources. In those cases, you need to use special care. Here's an example: Suppose you find an image of, say, Mickey Mouse, on a CD-ROM. You might think you could use that image in your company newsletter, but you'd be wrong. Disney owns the rights to all representations of Mickey Mouse, and using that image in any commercial way violates Disney's legal rights. If Disney decided to sue — and it has in the past — you could find yourself in court.

What's the answer here? Since you may not find copyright information on such images, use your common sense. Odds are that if you recognize an image from a company, you'd better not use it without permission. Play it safe. There's just one more thing to avoid. You can legally use logos, trademark symbols, and government seals, but only if you're not misrepresenting yourself. For example, use the IRS seal in your advertising, and you may get an unwanted visit by men in blue suits.

Finding What You Need

CD-ROM *Today* went looking for clip-art collections, and we've covered a variety of them below. These products are representative of what's available, but there are many new collections in the works. If you're a PC user, you'll also find extensive clip-art collections in some of the shareware and public-domain CD-ROM collections (see "A Bang for Your Buck!" elsewhere in this issue). Other sources of CD-ROM clip art are the extensive collections included

with graphics programs like *Corel Draw 3.0*, *Micrografx Graphics Works*, and other such applications now available on CD-ROM.

Clip Art Collections

AdArt Clip Art for Advertising

If you need a logo, symbol, flag, or an attention-getting image for advertising, you're going to find it in this high-end (\$999) collection from Innovation Advertising & Design. All images are in EPS (Encapsulated PostScript) format for perfect scaling on PCs and Macs using PostScript output devices. Images are black and white, and make an ideal collection for users who create advertising or business stationery.

Clip Art Goliath

Pictures, pictures, and more pictures. That's what you get in this massive collection from Chestnut. You'll find more



than 11,000 images here, predominantly black-and-white line drawings in TIFF and PCX format. Most images are in the public domain, allowing free use, and cover every category imaginable. Image quality varies widely, with some outstanding images mixed in with others of lesser value. A cataloging program lets you see listings of the image files, with no descriptions, and you'll need a graphics viewing utility to see the images. Fortunately, several such utilities are included

on the CD for DOS and Windows users. Still, for just \$29.95, this is a collection that adds to any library, just for the sheer number of available images. Mac users may be able to access the images themselves with the appropriate foreign disk utility, but all software runs only on the PC.

Fresh Arte

This \$99.95 CD collection from Quanta Press is the second volume in the series launched with its *Publique Art* disc. It includes about 1500 images in the PCX and PICT format to make the disc usable on both PCs and Macs. All art is in the public domain, requiring no royalties or acknowledgments, and was designed by professional graphic artists. Images are quite large, and scanned at 600 DPI, and

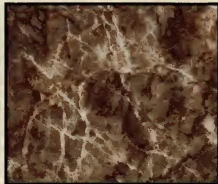


search, retrieval, and viewing software on the disc lets you find the image you want quickly.

You'll find images re-lating to just about any topic in this collection, but, like the companion *Publique Art* collection, these images are broadly drawn and are best used in reduced sizes for less formal documents.

Marble & Granite

Where most of the collections reviewed here offer a variety of clip-art images, the \$395 *Marble & Granite* package from Artheats offers just what the title implies: full-color pictures of stone. Why? Marble and granite images make excellent backgrounds for everything from brochures and pamphlets to screen images for presentations and multimedia projects. The 1.3 gigabytes of images are in TIFF and TARGA file formats for both Macs and PCs on two CD-ROM discs. An additional set of images optimized for laser printing makes creating black-and-



white marble textures a snap. Printed samples help you select the image you want. Full color is available for these images, which come in multiple sizes for easy scaling to your project. You can use the images in any way you like, as long as you don't sell the images by themselves.

MapArt

Maps are an important class of clip art, and this \$179 CD-ROM collection from Cartesia Software supplies both PC and Mac users with just about any map they can think of. Unlike many other collections, the images here are available both as EPS files and in *Adobe Illustrator* AI files, so you can edit them to suit your needs if you have *Illustrator* or another program that can edit AI or EPS files. The maps are all object-oriented images, so it's



easy to manipulate them with the proper software. Otherwise, you can simply include the EPS images in your documents. Maps cover the entire world, the U.S. by state and county, and major metropolitan areas, giving you a wide selection, including a variety of views of the whole globe.

MediaClips

This series of CD-ROM discs from Aris Entertainment doesn't fit neatly into the

clip-art category. Described as coffee-table books, the packages in this series — *Worldview*, *Wild Places*, *Majestic Places*, *Money*, *Money*, *Money!*, *Business Backgrounds*, *Full Bloom*, *Island Designs*, and *Jets & Props* — all contain 100 images (the latter two are two-disc sets with 200 images) as well as audio clips, sound effects, and, on several of these discs, mini-movies. Each of these discs carries a suggested retail price of \$39.99, with the exception of *Jets & Props* (\$59.95). Both PC and Mac formats are supported. The PC versions support PCX, BMP, and TIFF (24-bit 640 x 480) formats, and the Mac versions offer both 8-bit and 24-bit PICT files. All images are royalty-free, and Aris allows use of its images in publications as long as the user includes the appropriate credit and copyright notices.

MegaToons

If you want to add a humorous touch to your



business communications, check out this \$199 package from Creative Media Services. It contains 600 business-related cartoon images in TIFF format, all drawn by well-known cartoonist Phil Frank, creator of the comic-strip "Farley," and whose work appears in many national magazines. The cartoons cover a wide range of topics and can punch up just about any publication. A complete printed catalog helps you choose the image you want. The license lets you use these images in your publications, but you cannot sell the images themselves.

Metro ImageBase

Containing 2000 black-and-white TIFF

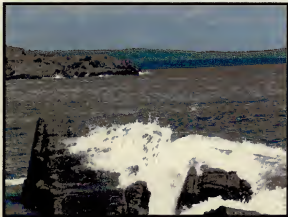
images, all scanned at 300 DPI, this \$149.95 collection for both PC and Mac users covers a wide range of categories, from Art Deco, business, and computers to holidays, religion, and sports. The quality of these images is excellent, and they're highly useful for business communications and advertising materials. Image sizes are large, allowing for easy scaling. The



license allows use in any publication, and a complete printed catalog of the images makes it easy to find the image you want. You won't find any graphics utilities on this disk, though — just the high-quality images.

Mother Earth II

If you're looking for photographic images of scenery, this disc from HammerHead Publishing is a good bet. It contains over



450 photos (in Windows BMP format) of scenery of all kinds. All photos come in two resolutions, 640 x 480 and 1024 x 768, and were taken by a professional photographer. The \$59.98 disc also includes several shareware applications that let you view, print, and convert the

images to other formats. Unlike most of the other discs reviewed here, though, these images can't be used in your documents without permission. In most cases, the license fees are reasonable, but fees are set based on how you use the image. Another CD from the same publisher, *Lovely Ladies II*, offers 400 photo images of women in swimsuits.

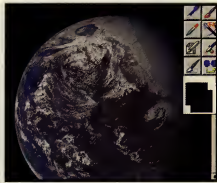
NEC Clip Art Collections

NEC — yes, the giant hardware company — publishes several collections of clip art on CD-ROM for both Macs and PCs. Collections offer everything from simple line art to color photographs and even 3-D clip art. Most discs include image editing software and support TIFF and EPS formats. While pricey, with most collections selling for over \$300, all images are of excellent quality, and the collections cover a wide range of subject matter.

Our Solar System

While not precisely a clip-art collection, this disc from Chestnut can serve as one. Along with a number of astronomical programs, the disc contains scores of images of the earth, planets, and stars, along with images of space exploration. These pictures, most of them full-color photo images from NASA, are in the GIF format, but the disc works only on PCs. Resolutions range from 320 x 200 to 1024 x 768, and most are in 256-color format. Since most software can't import GIF files for printing,

you'll have to use a graphics utility to convert the images for use in your documents. Fortunately, an excellent shareware conversion utility is included on the CD, along with an excellent viewing utility. At \$29.95, this CD is a low-cost and unique source of space-



related images. Chestnut doesn't sell directly to consumers, but will supply you with the name of a dealer near you.

Publique Art

You'll find more than 2500 public-domain clip-art images on this \$99.95 CD-ROM from Quanta Press. The images are completely royalty-free, so you can use them however you wish. All of the pictures are black-and-white PCX line drawings, and can be printed on any printer. Since the clips are scanned at 600 DPI, they're quite large in native size, but they scale well. No previewing software is included on the disc, so you'll need your own graphics program to view them. Categories include aircraft, animals, borders, farming, holidays, people, plants, and religious images. You'll also find pictures relating to travel, tools, vehicles, and sports. Renderings tend to be drawn in a loose, freehand style, which is particularly useful in reduced sizes for casual documents.

Seals of the U.S. Federal Government

This collection contains the official seals and logos of government agencies, as produced by the U.S. Government Printing office. The images are in TIFF format, and are accessible on both PC and Mac platforms with standard CD-ROM drives. You'll find hundreds of seals and logos. If you do creative work for or with any federal agencies, this \$79.95 collection is a must.



The Journey of a Lifetime

Steven Anzovin



From Alice to Ocean is perhaps the most unique multimedia product to date. This two CD-ROM/book combo covers Robyn Davidson's extraordinary six-month, 1700-mile trek across Australia's outback.

In 1977, a determined young Australian woman named Robyn Davidson set off across the forbidding outback of central Australia alone on camelback, a feat never before attempted. With her went an ambitious American photojournalist, Rick Smolan, who hoped to get a *National Geographic* cover out of the assignment. The journey took more than six months and covered 1700 grueling miles, from Alice Springs in the center of the continent to blue Hamelin Pool on the west coast.

Along the way, Davidson dealt with isolation, heat, thirst, poisonous snakes, bloodthirsty bull camels, Aussie rednecks, rude tourists, obnoxious reporters, and, hardest of all, her own weaknesses and fears. Tough-minded and tart-tongued, Davidson worried about how letting a journalist come along had sullied the experience, but she forged ahead, finding that the real point of any daring journey is not to see the scenery, beat the odds, or prove something to the world, but to find something in oneself.

Davidson's travels, described in her bestselling 1980 book *Tracks*, have been compared to the exploits of Beryl Markham, Isak Dinesen, and other intrepid women writers. Her adventure is now the basis for a highly touted, high-tech publishing venture, *From Alice to Ocean*, an innovative book/CD-ROM package that pioneers a whole new area of multi-format publishing. The \$49.95 package consists of a conventional coffee-table book featuring excerpts from *Tracks* and photographs by Smolan, plus two CD-ROMs. One disc contains a Macintosh-compatible, interactive multimedia program packed with the text of the book, hundreds of beautiful 24-bit color images, QuickTime movies, spoken narration (by an actress, not Davidson herself), photography tips from Smolan, sidebars on Australian life and culture, and a didgeridoo soundtrack. The other disc is a Kodak Photo CD with more than 100 additional images that can be viewed with a slideshow program included on the disc.

New Technology Showcase

Smolan, who masterminded *From Alice to Ocean*, is the creator of the hugely successful *Day in the Life* coffee-table photo books and is something of a publishing phenomenon himself. He conceived of the project as a showcase for multimedia CD-ROM and Photo CD technologies, and secured the cooperation of Apple Computer and Eastman Kodak, which provided grants, hardware, and technical assistance. *National Geographic* and book publisher Addison-Wesley also were involved.

Apple, Kodak, and company jumped at the chance to tackle this project in part because it is based on an already successful property. *Tracks* has sold more than 400,000 copies since its publication 13 years ago, making it a minor modern classic. (Can a major motion picture be far behind?) The biggest unknown, from the publishers' point of view, is the Photo CD disk. Viewing that disk requires a Kodak Photo CD player or a multisession-capable, Photo CD-compatible CD-ROM drive, such as Apple's new AppleCD 300-series drives (bundled with the Performa 600 and other new Macs). As yet, only a small number of people own either device, so Smolan recommends

that consumers head down to their local electronics dealer and play the disc



there (where, Kodak hopes, they'll be inspired to buy a Photo CD player or a CD-ROM-equipped Mac). Despite the inclusion of the discs, the package is being sold primarily in bookstores. As interest in *From Alice to Ocean* is growing, however, this unique bundle, from San Francisco-based Magnum Design, is starting to appear in software outlets, as well.

Does *From Alice to Ocean* live up to the hype that has attended its release? The book is expertly produced, as you would expect; it's extraordinarily handsome and unusually readable for a coffee-table book. The Photo CD disk is valuable as the first exposure many will have to Kodak's new technology,



but the images it contains add little to the whole. The interactive disk, however, is very well done — one of the best examples of interactive CD-ROM multimedia yet produced. Although the disc and the book cover much the same basic ground, there's so much more on the disc — narration, music, movies, maps, and sidebars — that CD-ROM owners are likely to tuck the book away on the shelf and travel along with Davidson by way of their Macs instead.



Living Well



A health reference is a natural for the CD-ROM format, so it's no wonder that three such titles are already available. Here's a hands-on comparative look at these products.

Heidi E. H. Aycock

With health care becoming more complex, more expensive, and more controversial, the average person needs reliable resources for medical information. A good health-oriented reference book can help people communicate with their doctors and assess the quality of their health care.

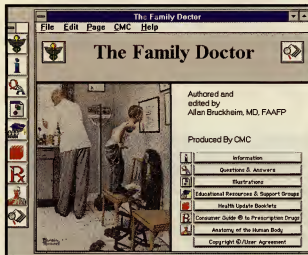
For people with CD-ROM drives, a health-reference book on disc offers features that no paper-based book can match. Of course, the converse is also true, but CD-ROM users already know the limitations of a book that can be read only on computer — you can't read it in your easy chair, you can't take it outside when your child has fallen off his or her bike, you just can't take it anywhere. The advantages, however, are terrific. In general, electronic books offer excellent tools to help you enjoy your reading so much that you may not miss your easy chair.

The desirable features of any CD-ROM reference book include well-written, accurate content; a well-designed interface for browsing through the information; a powerful search feature for finding information quickly; and graphics, sound, and perhaps animation that augments the content and adds overall appeal. Any health reference on CD-ROM should meet high standards for all of these features.

Three health-reference CD-ROMs have been released in recent months: *The Family Doctor* from Creative Multimedia Corporation; *Mayo Clinic Family Health Book: Interactive Edition* from Interactive Ventures via Sony Electronic Publishing; and *Vital Signs: The Good Health Resource* from Texas Caviar. Each of these discs, available in both MPC and Mac formats, excels in some areas and falls short in others. Here's a close-up look at each title.

The Family Doctor

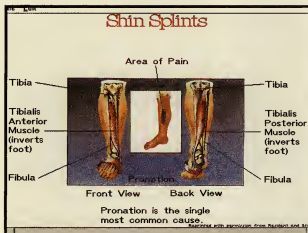
At its heart, this product is a collection of Q&A-style articles by Dr. Allan Bruckheim, reprinted from his syndicated column. There is no sense of thoroughness here, but the questions address many common health



The opening screen of *The Family Doctor* shows command options and browsing possibilities.

issues. As Bruckheim himself says, *The Family Doctor* is just a starting point for people exploring health concerns.

The writing is clear and friendly, and it's obvious that Bruckheim strikes an empathetic chord with his readers' concerns and needs. The text is accompanied by quality graphics, and the images of various anatomical systems and biological functions are clearly and colorfully rendered. In the graphic of the human anatomy, a single



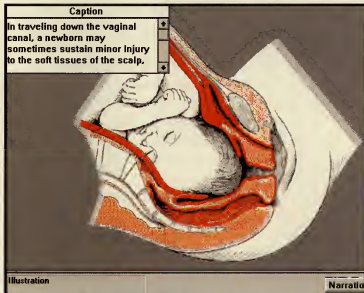
In *The Family Doctor*, an annotated illustration explains the possible causes of painful shin splints.

mouse click magnifies body parts, pronounces their names, or isolates different body systems.

Besides good content and presentation, *The Family Doctor* features an excellent interface. The action buttons that take you from one section to another are always available on the screen edge. The Search feature is powerful and fast enough to sift quickly through many levels of information from subjects to titles to full texts.

The Mayo Clinic Family Health Book: Interactive Edition

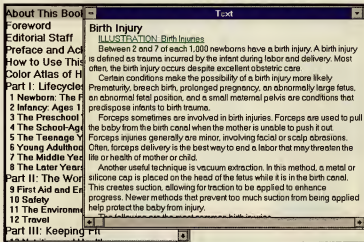
Written and reviewed by Mayo Clinic staff members, this disc presents information in a series of chapters, covering life cycles, the environment, fitness, and diseases. This book is complete, and it was obviously written — and it's written well — as a paper-based volume first. While *Mayo Clinic*,



In the *Mayo Clinic Family Health Book*, the illustration of a birth is accompanied by spoken narration about birth injuries.

like *The Family Doctor*, addresses specific lay questions, it also offers a lot of depth in content across a broad range of categories in the medical field.

In addition to the high-quality text, *Mayo* includes graphics generated by medical-imaging equipment, such as ultrasounds and angiograms. Unfortunately, these pictures, like the real thing, are difficult to discern. On



Mayo Clinic's interface is designed around text buttons and windowing commands.

the other hand, the annotated drawings of human anatomy and body systems are excellent.

Initially, *Mayo's* interface may seem obtuse — there are no icons to be found. However, it's actually very simple — in hypertext fashion, words can be activated as text buttons, so you can access items by simply clicking on their names. Along the bottom of the screen, information about command options is displayed. Of the three products reviewed here, *Mayo's* interface is the most elegantly designed because of its simplicity and clarity.

Like the interface, the Search tool is very simple to use. While it offers neither Boolean operators nor multi-level searches, such as those offered in *The Family Doctor*, it's powerful enough to help you find any information included in the book.

Although *Mayo* is an excellent product, it did crash mysteriously a few times. Yet, of the three discs, it's the best synthesis of good information and technological skill.

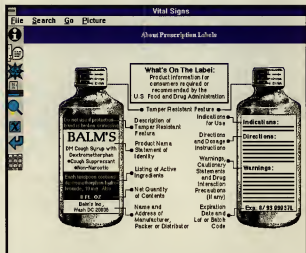
Vital Signs

This product is a collection of articles from various sources, including government agencies and research institutes. The information is presented as a series of stand-alone reports. Although *Vital Signs* has something of a patchwork feel, similar to that of *The Family Doctor*, it also seems as complete as *Mayo Clinic*.



Vital Signs opens with a graphically oriented menu screen showing the topics and commands available to the user.

Unlike the other two products, *Vital Signs* has variable writing quality. Some articles are friendly; some are dry. Some are perfectly written; others are peppered with confusing typographical errors. Graphics consist of simple line drawings that offer no sense of depth, but they are, in some cases, easier to digest than the more complex graphics of the other two discs.



The detailed illustration of a prescription label is an example of the black-and-white line drawings found in *Vital Signs*.

Vital Signs' main screen consists of a large button for each section of the book as well as command buttons running along the side of the screen. Once you go beyond the first screen, however, the program uses text buttons rather than icons.

While the interface is conceptually well-designed, it's the weakest part of the product. The text is so small that you must be careful to click in exactly the right spot to get the expected result. (In fact, even when you click in the right spot, you may not get the anticipated result.) Frequently, I clicked on one title, only to get an article on a totally different topic. *Texas Caviar* has some problems to work out before this disc is up to par with the others.

Of the three discs, *Mayo Clinic Family Health Book* is the best investment — it's a complete reference book, and it's as technically sound as it is easy to read. While *The Family Doctor* is also well-engineered, it falls short of being a complete health reference. It makes a good supplement, though.



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REVIEWS

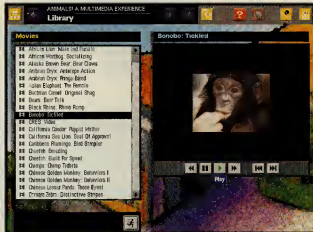
REFERENCE

The San Diego Zoo Presents...The Animals! DOS/MPC/Mac The Software Toolworks

If you're still not convinced that multimedia lives up to its reputation, a few minutes with *The Animals!* should make a believer of you. Boasting an hour's worth of video clips and more than two- and-a-half hours of audio, *The Animals!* is one of the most entertaining CD-ROM titles on the market. Although obviously targeted at younger audiences, animal lovers of all ages will be delighted from the start.

The Animals! lets you explore the world-famous San Diego Zoo on a number of different levels. The program's main menu is a map of the zoo's different exhibits. By clicking on, say, the tropical rainforest, you're taken to the zoo's rainforest exhibit, where you'll see, hear, and learn about the animals of that particular ecosystem. In addition to these exhibits, the map lets you access an animal nursery, gardens, and other areas of interest. Another nice feature is the overview; the sharp still shots and a running narrative set on top of background sounds and music guide you through the program's many paths.

If you prefer, you can jump right in and access video, stills, and text on any of the zoo's 200+ animals. Alphabetical lists make it easy to find what you're looking for, and once you do, you can use the built-in AV link to explore related subjects. Another mouse click takes you to



a species' natural habitat; so if you've first called up info on the Giant Panda, then used the AV link to see the Grizzly Bear, you can jump to the grizzly's ecosystem and visit the grizzly's other neighbors.

The audio portions in both the DOS and MPC versions have some of the "snap, crackle, pop" characteristic of a .WAV file. But they're clear and crisp enough, combining music and ambient sounds (ambient for a zoo, that is) to set an effective mood. You may tire of the sweeping, recurring theme music, though — the effect is stirring at first, but soon becomes cliché.

The MPC version runs at a fixed resolution of 640 x 480 with 256 colors, so an SVGA card is a must. The still photographs look terrific — crisp, colorful, and quite professional. The DOS version runs at the same resolution, but with only 16 colors, it doesn't look as good.

Videos are displayed in a fixed window, and cannot be resized. But the window is large enough to provide easy viewing, while keeping pixelization to a minimum. Because they utilize a full 256 colors, the videos in the MPC version are

more pleasing than those of its DOS counterpart. In either case, the speed of your processor and video card will make a difference. We achieved very good results on a 386/40 running with a Windows accelerator. On slower systems, you can expect to see frames dropped as the image struggles to synchronize

with the sound.

The animals themselves are the real stars of this program, and from the amazing video of a giraffe's birth to the unforgettable, almost human laughter of a baby bonobo, *The Animals!* serves as a wonderful showcase of life on earth. The San Diego Zoo's commitment to natural habitats and reverence for animal life come through in every picture, sound, and video, and add immeasurably to the quality of the product.

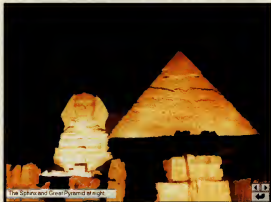
Bill Gates mentioned this as one of a handful of products that will sell the concept of multimedia. After a few minutes with *The Animals!*, you'll see just how right he is.

—Matthew A. Firme

**Great Wonders of the World,
Vol. 1**
MPC/Mac
InterOptica

The Great Wonders of the World don't provoke enough awe anymore. Blame it on our newfangled world and our

preoccupation with modernity. InterOptica's reference CD-ROM, however, goes a long way in restoring an old-style sense of amazement about the great man-made wonders.



It's difficult to imagine a smoother approach to this subject. The information on this CD-ROM is entertaining and painstakingly thorough. The materials are served up via a straightforward interface. And *Wonders, Vol. 1* lives up to its multimedia billing, with plenty of music, narration, photography, video, and even a little animation.

Each of the ten wonders (the Pyramids, the Great Wall of China, the Taj Mahal, the Trans-Siberian Railway, the Cathedral at Chartres, the Inca Ruins of Peru, the Panama Canal, the ancient temples of Angkor Wat, Venice, and the Empire State Building) is sectioned off into about ten individual categories that you can explore or ignore.

Some categories shouldn't be missed. The Slide Show, for example, gives you a narrated overview of the subject along with first-rate photography. You can move ahead, repeat screens, or just sit back and let it roll. Likewise, the chronological History category encourages getting sidetracked with supplemental photos and video bits.

Should you be so intrigued with any of the wonders that you want to experience them first-hand, the Travel Info category lays out everything you need to

know about planning a visit, from odd local customs to currency conversion.

The program's greatest strength is the quality and breadth of the information. Every relevant statistic and fact has been

compiled, including assorted tidbits of trivia (i.e., during maximum winds, the Empire State Building sways a mere half inch; Lord Byron used to swim the canals of Venice fully dressed; the Great Wall of China can be seen from the moon).

This product offers a charming journey around the globe and through history. In particular, school systems with multimedia computers should get this product into their libraries. It's easy to use and has much to offer. *Great Wonders of the World, Vol. 1* is wonderful — truly and literally.

— *Phill Powell*

• • • • •

Twelve Roads to Gettysburg

MPC/Mac
Ebook

As an interactive history book, *Twelve Roads to Gettysburg* offers a macro- and microscopic view of the three days that determined the course of the Civil War and American history. Using maps, narration, photographs, and some minimal animation, *Twelve Roads* provides a wealth of detail on the armies, places, events, and personalities involved.

The main menu offers five ways to approach the battle, with various emphases and levels of detail in each. Five icons lead to interactive presentations on Campaigns and Strategies, The Battle, Confederate Armies and Leaders, Union Armies and Leaders, and Gettysburg Today.

Each focuses on a different aspect of the battle, offering many layers of detailed

exploration. Campaigns and Strategies uses text, period engravings, narration, and colored maps to show the origins and progress of the Civil War. The story unfolds in a lengthy presentation that allows you to click on various words or names to get more detail. For example, selecting the name of Robert E. Lee brings up a moderately detailed biography of the great Confederate general. This interface is used to great effect throughout the program. If the presentation mentions a minie ball and you'd like to know more, click on the word and a photograph and history of the minie ball appears. Another click takes you back to where you left off.

The section on The Battle is a narrated presentation with crude but effective animated maps. Buttons allow access to each of the three days of the battle, with options for greater or less detail. Sections on the personalities and armies of both



sides allow instant access to biographies and the history of each division in the battle, with an excellent interface tree illustrating the chain of command. A final option provides a tour of the Gettysburg National Military Park as it is today.

Twelve Roads is not without problems. It is needlessly, frustratingly slow, and it's often hard to distinguish colors and details on the animated battle maps. But, on the whole, this title nicely illustrates what a powerful tool multimedia can be for studying history.

— *T. Liam McDonald*

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The text of all four books — *Unlimited Power*, *Awaken the Giant Within*, *Unlimited Wealth*, and *Other People's Money* — is contained on the CD-ROM. The interview is carefully linked to the books, and when you click on the link button, you read the appropriate section from the book. From there you can go to other sections, other books, or back to the interview. Or you can bypass the interview completely by accessing the contents screen for any of the books, reading them as your time and energy permit.

Multimedia PowerTalk! is commercial multimedia as it should be: fast, topical, and even a bit glitzy. In other words, just like Robbins' infomercials themselves. ZCI plans less expensive CD-ROMs, using the same presentation technology, on subjects such as Malcolm X, endangered species, and JFK. If *PowerTalk!* is any indication, they'll all be welcome.

— Neil Randall

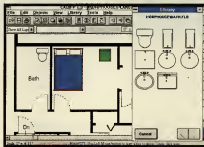
Complete House

MPC/Mac
Deep River Publishing

If decreasing mortgage interest rates and an expanding economy have you thinking about custom building a house, you're undoubtedly interested in planning that new home. That's the job that Deep River Publishing's \$99.95 *Complete House* CD-ROM tackles. It's designed to give you the information you need before contacting an architect or builder.

Running under Windows 3.1 (a Mac version is on the way), *Complete House* takes you step by step through the history of home design. The program then leads you by the hand into the world of design concepts and helps you think about many of the options involved in designing a house.

Illustrated with examples from many schools of architectural design, *Complete House* also includes narration. It looks at personal and environmental concerns, and examines the relative merits of several basic design questions, such as the differences between bathroom and kitchen layouts and what they mean to your family. Also included



is a computer-aided design (CAD) program, specifically set up to let you draw floor plans, complete with furnishings.

The idea behind *Complete House* is excellent, but the result is heavy on philosophy and light on details. For example, in the discussion of windows, the program tells you that different types of windows have advantages and disadvantages that should influence your choice, but doesn't tell you what those advantages and disadvantages are. This lack of specific information occurs throughout. Just as the program whets your appetite for information, you're often left without the details. This is especially unfortunate since *Complete House* uses less than half the available space on the CD-ROM.

You can examine scores of sample home designs, with full-color photos and floor plans, but all are high-end custom designs by major architectural firms. You can print any of the pages, including the artwork. Still, you'll find more variety in inexpensive home-design magazines available on most newsstands.

Finally, the floor-plan CAD program is quite slow, even on a 33-Mhz 386DX



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machine, and documentation is limited. Users unfamiliar with drawing applications may find the program tough to learn. While 20 sample floor plans are included, they don't include the sample homes displayed on the CD-ROM.

Overall, *Complete House* is an interesting, multimedia overview of home design history and concepts, but it lacks the detail needed to help you make real decisions you can take to your builder or architect.

—George Campbell

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U.S. Atlas and World Atlas DOS/MPC The Software Toolworks

One of the most obvious yet intriguing CD-ROM applications is a detailed atlas. Demographics, statistics, topography, history, and other important facts can all be presented in a neat, simple package. Two such packages are The Software Toolworks' *U.S. Atlas and World Atlas*. Each uses a simple interface to access a fairly powerful database and a series of moderately detailed maps. While these programs don't operate on microscopic levels of detail, they are still the best broad-based CD-ROM atlases on the market.

U.S. Atlas is simply a more focused version of *World Atlas*, and the interfaces are nearly identical. Where one deals with countries, the other zeroes in on states. In *World Atlas*, the planet is presented in regional groupings such as North America, Central America, South America, etc. Pull-down menus or clicks directly on the map zoom you into the next level, displaying the various countries that comprise a region. Another zoom chooses an individual country, and shows some of the major cities, towns, and roads on a plain, non-topographical map.



When a new country is selected, its animated flag flutters to the top of a flagpole, a voice pronounces its name, and its national anthem plays.

An icon bar lets you page back and forth between various views, or choose any number of data-crunching features to analyze a country or region in more detail. While the main maps are somewhat plain, regional topographical maps are available



through an icon. Though it would have been preferable to have topography available at the country level, basic representations of elevation and terrain are effectively rendered for each region. In *U.S. Atlas*, topography is included for each state.

Statistical maps, graphs, and general information are also accessible from the icon bar. A wide selection of topics and categories is available for each country. Education, agriculture, health, crime, and other general categories are broken down into more specific classes of information. Using a simple menu system, you can choose any one of literally hundreds of topics. The Statistical

Map function then creates a shaded map for a particular region of the world, graphically representing those statistics. Should you like to see comparisons of, say, the wheat production of 15 different countries, the Graph option will guide you through a series of menus and generate a three-dimensional comparative bar graph. This can be done for countries or states you select, the top 15, or the bottom 15.

Other data is available through the Information icon, which presents text descriptions for topics such as government, travel, and communications. The results of recent elections, tourist contact information, and descriptions of various aspects of each country can be cut and pasted directly into a document.

There are smaller features such as map markers, distance finders, and time zones, but the strength of these atlases lies in their far-reaching databases. A wealth of information is available with a mouse click, and while the maps aren't going to win any cartography awards, they are serviceable and effective. Both atlases are a worthy and important addition to any CD-ROM library.

—T. Liam McDonald

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Microsoft Musical Instruments MPC/Mac Microsoft

It's no secret that CD-ROM is an extremely valuable medium for education and reference, but even so, some titles stand out above others. For their showmanship, *Microsoft Instruments* may well be one of the best.

Musical Instruments is an encyclopedia of instruments from around the world.

Most of the focus is on the instruments found in the music of the West, but learning about these is only half of this program's charm. The other half, and perhaps the more significant, is that you can learn about a wide variety of instruments from Africa, South America, and the Far East. Like most people, you probably haven't heard of many of these instruments, but part of the fun is realizing that you've encountered their sound in movies, on Paul Simon or Brian Eno albums, and in *National Geographic* TV specials.



The Contents screen tells you what's available. "Families of Instruments" clas-sifies all instruments on the CD according to Brass, String, Woodwinds, Keyboards, and Percussion. Click on any of these, and you get a screen filled with the types of that kind of instrument. Percussion, for instance, is subdivided into drums, drum kits, kettledrums, gongs, rattles, frame drums, Jew's harps, woodblocks, gongs, clappers, xylophones, scrapers, chimes, and cymbals. Click on Drums, and you get another breakdown, this time on a screen showing 14 drum types, each with its own sound icon that yields the typical sound of that drum. From here you can click on the drum type itself and find yourself in another

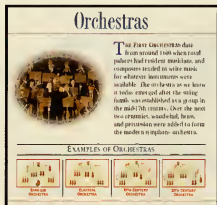
classification, with extended sounds, other information, and hypertext links to other instruments.

The other three main sections work similarly. "Musical Ensembles" offers a look at orchestras, steel bands, wind bands, jazz bands, rock bands, chamber groups, and gamelins (Indonesian). "A-Z of Instruments" organizes all subjects alphabetically. Finally, "Instruments of the World" shows you a world map—click on any area (e.g., Southeast Asia, South America), and you can peruse any of the instruments of that region.

This is a clean, attractive program packed with information. You'll find yourself wishing for longer samples of an instrument, but even in the few seconds given, you'll soon be able to distinguish one instrument from another. Now, if only Microsoft would release Folk Songs

and Sacred Music of the World, we might just begin to better understand what other cultures are about. There's no surer way, after all, than in hearing the music they create.

—Neil Randall



ENTERTAINMENT

The 7th Guest

DOS

Virgin Games

After two years of hoopla, hype, and hard work, one of the most hotly anticipated computer games ever has been unleashed. Weighing in at one gigabyte on two CDs, *The 7th Guest* is indeed a heavyweight contender, with the gorgeous graphics, full-motion video, lush soundtrack, complex story line, and compulsive playability to prove it. The creative team at Trilobyte has spent thousands of man-hours creating a new level of gaming.

Is it the high-water mark for games that some people say it is? Yes. Is it flawless? No.

In case you missed the stories and sneak peeks about the game in the past year, *The 7th Guest* is, in short, an interactive horror movie wrapped in enigmas that you must unravel. Even the premise, established in a long opening section, is somewhat puzzling, and only comes into focus as the story unfolds. The entire game is played in the mansion of Henry Stauf, a small-time thief turned millionaire toymaker. It's the 1920s, and Stauf has secluded himself following a mysterious epidemic that claims the lives of children—an epidemic that may be linked to his toys. He invites seven guests to his mansion, offering them fulfillment of their deepest desires. The identity of the seventh guest, however, is a mystery.

The design of this product is unique. There is no inventory, no combat, no death. The view is letter-boxed, like all good wide-screen movies should be, but whose view is it? Who are you? That, too, is part of the mystery. Suffice it to say that you navigate the rooms and halls of

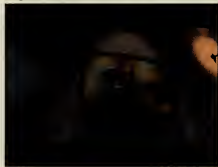
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Stauf's house, running across the ghosts of other guests, and, piece by piece, learning their fate as you come closer to learning the mystery of the house. You cannot interact with them nor they with you. They are, after all, ghosts. Not all rooms and scenes are available at once: They only become so as puzzles are solved and other rooms are entered.



Stauf's puzzles have been built into the texture of the house itself—a maze inside an Oriental Rug, a cipher made up of food cans, a clue hidden inside the canals of Mars as seen through a telescope. There are 27 puzzles in all, running from the simple to the devilishly difficult.

A book with clues to each puzzle is included in the downstairs library, but the clues themselves are, unfortunately, often poorly constructed and of little help. The critics who thought there was no "game" inside *The 7th Guest* are proven wrong: There may be a little too much game, as some of the puzzles are well-nigh impenetrable.



The graphics are, in a word, awesome. Nothing like this has ever been seen before, and each room is more gorgeous than the last. The raves are somewhat tempered by acting that goes from fine to just plain awful, and by a protracted catacomb-crawl that's possibly the most boring and annoying maze in the history of computer games.

But these are trifles when considering the whole. The game is filled with more atmosphere than a dozen others. It's rather like being thrust into an interactive version of the classic film *The Haunting*, in which every room drips with dread. Using a daring design, state-of-the-art visuals, a high caliber of writing, and clever puzzles, *The 7th Guest* totally revises our attitudes about what computer games can do.

— T. Liam McDonald

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Victor Vector & Yondo: *The Vampire's Coffin*

Mac
Sanctuary Woods

As Shakespeare once put it, "The best laid plans of mice and men oft run afoul." Apparently that axiom also applies to dogs and men as well. *Victor Vector & Yondo: The Vampire's Coffin*, the first in a

new series from Sanctuary Woods, is an ambitious attempt to meld a classic adventure game with artwork and dialogue that lend a good-humored comic-book ambience to the puzzle.

That concept was proven in 1992, when Mike Saenz, original illustrator of the Macintosh-produced action comic-book "Shatter," released Reactor's CD-ROM cult-classic *Spaceship Warlock* on an unsuspecting public.

Like *Warlock*, *The Vampire's Coffin* (the first in the Vector & Yondo series) uses Macromind's Director software as the engine that links the graphics and sound building-blocks of the game. While Macromind's software speeds up the game-development process, it tends to result in applications with a distinctly lock-stepped "serial" feel with minimal animation and variability. *Warlock* made amends for that by combining extremely high-quality artwork with a hip soundtrack, a big universe of locations, and a wry sense of humor.



The back of the package pretty much spells out the plot: "Victor Vector and...Yondo, the digital dog, travel back in time to Transylvania to find Dracula's coffin for the Museum of Fantastic Phenomena." If Victor and Yondo are to earn more than a footnote in the CD-ROM version of Multimedia, a serious overhaul of the series' structure is in order.

By modern comic-book standards, the artwork is only a notch or two above average, and Victor bears a distracting similarity to Peter Parker (Spiderman's alter ego). The adventure's real estate

needs to expand dramatically — less than two dozen locations and easy-to-solve puzzles required only a little more than a few hours to breeze through. I'd gladly give up the silly Quicktime clips from old vampire films in exchange for more depth of play. Other than the presence of vampires, the videos have nothing to do with the game. The dialogue's attempts at humor are forced, and the interface with which one manages objects in the backpack is less than reliable.

It's tempting to give the Sanctuary Woods crew an "A" for effort for *The Vampire's Coffin*, but Victor and Yondo's overall grade is only an "incomplete" until the developers smooth out the series' rough edges. Here's hoping that Victor & Yondo's second adventure, *The Dinosaur's Egg*, makes some needed progress.

— Arlan Levitan

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Sherlock Holmes, Consulting Detective, Volumes 1 and 2

DOS/Mac
ICOM Simulations

Interactive movie," a pet phrase in computer entertainment circles, describes the player performing actions that trigger video sequences to move the game plot along. ICOM's *Sherlock Holmes, Consulting Detective* was the first CD-ROM game to use video to such a large extent. In this regard, ICOM deserves recognition.

Unfortunately, as a game, *Consulting Detective* never rises far enough above its medium to stand out, and its failings point to the challenge that faces any game designer relying on extensive video sequences: replayability.

Consulting Detective has its origins in the excellent "Sleuth" paper game, and



the cases have been ported to computer with little change. At least one has added an extra plot twist to lengthen play time, but on the whole this is a faithful adaptation of a superior gaming system. There is little gaming difference between *Volumes 1 & II*. (*Volume 3* was arriving as this issue was going to press.) The second adds a bit more control over video playback, but retains the same navigation interface and video frame rate of the first title.

The system is easy to use, with icons for Holmes' notebook, where the names of suspects are kept; a phone directory listing the names of various relevant Londoners; several issues of *The London Times*; a horse and carriage for traveling about London to question suspects and witnesses; Holmes' files, for background information; and the Baker Street Irregulars, who can be assigned smaller tasks of investigation. A gavel icon brings up the trial sequence — if all the proper clues have been revealed — where the game is won or lost.

All of the cases develop in the same manner. An introductory video sequence sets up the case. You send Holmes and Watson scurrying about London to question people. Each proper choice



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triggers a video sequence, and the case slowly unfolds. Unfortunately, each video sequence you view adds points to the final score, the goal being to get a score as low as Holmes by visiting the fewest possible places. This is supposed to add replayability as you try to lower your score with each replay, but that's hogwash. No one replays a mystery game for which they already know the denouement for a better score, and here's where *Consulting Detective* trips on its deerstalker cap. The game is utterly unplayable.

Each disc offers three cases: The Mummy's Curse, The Myst-ified Murderess, and The Tin Soldier in *Volume I*; and The Two Lions, The Pilfer-ed Paintings, and The Murdered Munitions Mag-nate in *Volume II*. As mysteries go, they're fairly simple and don't tax the gray matter too much. The production value of the video sequences is quite good, with some decent acting and serviceable sets. While it's all perfectly well-done and entertaining, there is simply not enough of it.

I whisked through all three cases of *Volume II* in about six hours. Finis. Game over. Unfortunately, much of the problem here is unavoidable because of the nature of the mystery as a story. Once it's done, it's done. Maybe more involved or challenging plots will redeem future installments of *Consulting Detective*.

— T. Liam McDonald

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Who Killed Sam Rupert?

DOS/Mac
Creative Multimedia Corp.

Computer-game whodunnits have been around since the early days of the original IBM PCs. This CD-ROM gives the familiar genre a very nice facelift, providing a delightful example of what consumers should expect from multimedia games.

Except for a butler, all the traditional characters and components of a traditional mystery are here. A handsome

soundtrack sets the stage, the spoken dialogue drives the plot, and the video footage provides critical information. An intuitive interface and graceful design make *Rupert* easy to play and also a delight for just sitting back and admiring. None of the title's components was added in a gimmicky or toss-in manner. In fact, every element is quite functional in serving a purpose in the presentation and unfolding of the plot.

The story features a literary richness frequently missing from computer mysteries. The contribution of veteran author Shannon Gilligan makes a resounding argument for the greater use of literary talent for games in which story line is important.

Sam Rupert's only weakness is its linear, single-solution path. Hopefully, future installments in this Virtual Murder series will offer multiple endings, creating a greater replay value.

A four-award winner of the INVISION Multimedia Awards, announced at the InterMedia Conference in April, *Sam Rupert* sets a refreshingly new standard for the look, feel, and content of multimedia games.

— Randy Chase

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restaurant owner is found dead in his wine cellar, and suspects include his mistress, his long-suffering wife, a bartender who's been stealing from the till, and a prima-donna chef.

The player must examine the crime scene, order forensic tests, view videotaped interviews of suspects, and extract information from a collage of clues that will lead to the eventual arrest of the guilty party.

Who Killed Sam Rupert? blends various multimedia elements into a cohesive and elegant package. The

Inca DOS Sierra On-Line

One of last year's most pleasant surprises in the PC game market was *Gobliins*, created by French publisher Coktel Vision and distributed in the U.S. by Sierra. Part puzzle and part graphic adventure, *Gobliins* looked and played great, and gamers eagerly anticipated the next title from Coktel.

Now Coktel/Sierra has released *Inca* (both CD-ROM and disk versions are



available), and once again they've scored a direct hit. The skillful synthesis of full-motion video, digitized speech, CD audio-quality soundtrack, and a pleasing variety of game play make *Inca* one of the finest multimedia games yet published.

Inca places you in the role of El Dorado, the golden one who has been chosen to bring about the rebirth of the Inca empire. To do that, you must find the three secret powers of the Incas, hidden 500 years ago to prevent their discovery by Spanish conquistadors.

There's a fair number of puzzles to solve before your mission is complete (although avid graphic adventurers would probably like to see more), but you'll have to be quick with your trigger finger as well as your wits if you hope to succeed.

You travel through deep space in a Tumi — "the empire's fighter craft," as the manual puts it — and that means plenty of outer-space dogfights against the forces of Aguirre, who symbolizes the Spanish conquistadors and their thirst for gold and power. (Aguirre was an actual conquistador who broke away from Pizarro's 1560 expedition to search for the fabled seven cities of gold.) Once you reach your destination planet, an autopilot takes over and guides your ship through the bowels of a canyon; all you have to do is control the throttle and blast enemy craft as you race to the end of the crevice. Except for the final climactic dogfight, outer-space combat is rather simplistic (the bitmapped graphics are excellent, however). But these sequences are meant to add variety to the game, not make or

break it, and on that level they succeed quite well.

Once you've left the Tumi, you duel with conquistadors who wield laser-firing swords, navigate mazes via a first-person perspective worthy of *Ultima Underworld*, and solve a nice variety of logic puzzles.

Digitized video can sometimes detract from other game elements, but with *Inca*, Coktel has struck a near-perfect balance — the video has been integrated in a fashion that enhances play rather than interfering with it. Crowning the entire affair is a soundtrack that complements the on-screen action beautifully. If you're looking for a game that earns the multimedia moniker, you can't go wrong with *Inca*.

— Stephen Poole

The Adventures of Willy Beamish

DOS
Dynamix

The box art for this graphic adventure might lead you to believe it's a kid's game, but nothing could be further from the truth. Don't let the nine-year-old title character and a plot that revolves around a trip to the "Nintari" national championship fool you; *The Adventures of Willy Beamish* is a very tough nut to crack.

Once you're dismissed for summer vacation (or sneak out of detention hall) and start roaming the streets of Frumpton, you'll discover that making it to the Nintari championship is the least of your worries. The plumber's town in Willy's hometown of Frumpton has gone on strike at the behest of Leona Humpford, the power-hungry owner of Tootsweet, manufacturer of artificial sweetener. Besides causing a shortage of clean water, the strike has closed the

Tootsweet artificial-sweetener factory: If the factory closes down permanently, a major portion of the town falls into the hands of Leona Humpford. To top it all off, Leona has chosen Willy's dad to be the fall guy in her scheme to gain control of Frumpton, and now that his services are no longer needed, she's ready to terminate him — permanently.

The puzzles in *Beamish* are some of the most challenging you'll find in a graphic adventure, with many requiring multiple actions involving several inventory items. The solutions are nearly always logical, though there are a few instances where the difficulty results from time limits, sparse descriptions, or odd logic triggers.



Beamish is peopled with an appropriately weird cast of characters, from the laggardly Coach Beltz to Willy's deceased Grandpa Beamish, and the excellent handpainted artwork and cell animation bring each one to life. Though some of the digitized voices — especially Willy's — are good, most sound amateurish, and don't really add to the experience.

The digitized speech is the only noticeable difference between the CD-ROM version and the original floppy-disk *Beamish*; even the save-game routine remains intact, an oversight which means you'll have to type in a new Save directory (the CD-ROM drive is the default) every time you load the game. But if you're more interested in a challenging, well-designed adventure than a multimedia extravaganza, *The Adventures of Willy Beamish* fills the bill quite nicely.

— Stephen Poole

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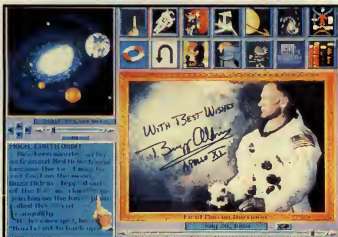
EDUCATION

Space Adventure

DOS

Knowledge Adventure

Knowledge Adventure's mission is to mix solid information with solid learning, and *Space Adventure* demonstrates how this company uses CD-ROM to help. Filled to the brim with sound, video, animation, images, and text, *Space Adventure* tries to teach you nothing less than the history of outer space itself, including human attempts at exploration. There's so much here, and it's so well presented, that you'll find it extremely easy to spend more hours than you probably have available simply browsing through it.



The main work screen is divided into four sections. At top left is a map window, from which you can zoom in on the earth from distances ranging from 10,000 light years down to 100 miles above the surface, or on which you can click to discover geographical information. At top right, 14 icons help you navigate your way through the program. The main window, at bottom right, shows the movie, image, or animation you've requested, and beside it a scrollable window displays text.

The program starts with a picture of Buzz Aldrin and a recording of his famous words, "The Eagle has landed." From here you can get a list of movies or simulations, or head to the icons and search for whatever you want. By sliding the time-line bar (at the bottom of the main window), you can see and read the information starting with the (theorized) origin of the universe and continuing into the near future. Or by using the library, you can specify topics, names, or anything else you want to learn about.

When you move the mouse around the main window, dialog balloons pop up, offering hypertext-style jumps into associated topics. This feature is a good idea, but in practice it's the only weak design in the program. The balloons simply take too long to appear, and at times you feel like you've lost control of the mouse. It works, though, and it demonstrates the power of hypertext navigation in a learning situation, so the speed problem is more than forgivable.

The strength of *Space Adventure* is its completeness. The movies are great, and the images both memorable and powerful, but you realize the true learning value when you access such topics as the history of rocketry, the telescope, or the Apollo program. By reading through even half the screens for any of these topics, you simply can't help learning something new, or at the very least refreshing your memory. Just in case you think you know it all, *Space Adventure* comes with a quiz game, and the manual offers some good suggestions about playing this in single or multi-player sessions.

Inevitably, you'll find yourself wishing that specific movies were available, or that some other snippet of information was part of the library. In the case of this disc, though, look for it. There's so much here that it's easy to miss great chunks of information, as every section offers more than meets the eye.

—Neil Randall

* * * * *

Where in the World is Carmen Sandiego?

MPC/Mac

Broderbund

We all know about the adventures of that wily thief, Carmen Sandiego. She's out to rob the world with her V.I.L.E. gang of villains, and the only thing between her and world domination is the dedicated team at ACME.

Not surprisingly, the CD-ROM version of *Where in the World is Carmen Sandiego?* sticks to the well-known and highly respected formula of its predecessors. You must still figure out who done it, and where they've flown in their zig-zag journey around the world to their secret hideout. And you'll still need to keep that copy of *The World Almanac* close at hand to decipher the location clues. It's the bells and whistles Broderbund has added to this version that make it attractive.



Traditional music at every stop along the journey gives the armchair traveler a better sense of the cultural flavor of a

particular destination.

Destination hints in the form of language lessons (via tape recorder of course) add even more realism to the adventure. And in an attempt to make the game more entertaining, characters that speak in the standard floppy-disk version have even larger vocabularies in the CD-

ROM version. Plus, there are a host of new speakers to listen to, including the ACME travel agent, Bart Samson, and Winnie the Squealer.

Given the amount of storage space on a CD, it's no surprise to find more animation, better sound effects, nicer music, and a larger variety of photos from each city in the game. But all of these improvements don't come free: The game plays quite a bit slower, and waiting for the travel agent to stop gossiping and get on with her job is very annoying.

The bottom line: If you've got a CD-ROM drive and you're short on hard drive space, get this version. If you just want to play the game, save money and buy the original disk-based version. You'll have just as much fun for much less dough.

— Leslie Eiser

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WordTales

Mac

Warner New Media

This engaging educational game for ages 4-7 teaches spelling by first-letter recognition and builds vocabulary at the same time. It's one of the more attractive educational CD-ROM titles I've seen, and certainly one of the easiest for kids to use. The clever, brightly colored animations, digitized speech, and intriguing sound effects immediately caught the attention of my seven-year-old



daughter, Miriam, who grabbed the mouse away from me and ran the game completely on her own.

A friendly green alien named Milo led Miriam to a central control room where she could click on several TV screens to begin the game. First Milo showed a

picture of a king and asked, "What is the first letter of 'king'?" When Miriam made the right choice, she was rewarded with Milo's enthusiastic approval — "That's it!" — and an animation revealing several more "k" objects that Miriam had to identify. In this manner, *WordTales*

addresses all the letters of the alphabet. This may sound boringly repetitive to an adult, but Miriam seemed to be exactly the right age for *WordTales*: she was adept enough to get most of the answers herself but still young enough to find it interesting. I had a hard time getting her away from the Mac so I could write this review.

Since some of the vocabulary here is above the heads of seven-year-olds, the key to getting the most out of *WordTales*, as with most other educational programs, is to play it with your kids. You can help them through the tough spots and have fun together at the same time.

— Steven Anzovin

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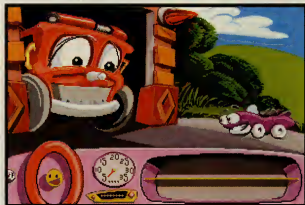
Putt Putt Joins the Parade

DOS/Mac

Humongous Entertainment

Targeted to ages 3-7, *Putt Putt Joins the Parade* is an outstanding effort from Humongous Entertainment. While *Putt Putt* is truly educational, it is a game that children will find hard to put aside once they've started playing.

The main character, Putt Putt, is an animated little car who resides just outside the friendly village of Cartown. His childlike voice and expressive eyebrows help shape him into an earnest, hopeful hero, one that children take to immediately. And they'll identify with his enthusiasm and determination.



Putt Putt's friends include an especially helpful fire engine, who explains Putt Putt's mission and offers tips to the small car. Other characters are charming and humorous, and all are extremely well animated. At times, even the landscape can metamorphose into animated characters or objects. For example, the apples on an apple tree explode as they fall from a branch, reassembling themselves into juice boxes which squirt their contents into a barrel across the street.

Humongous built a great game that entices children not only with its solid game play, charm, colorful graphics, and wonderful animations, but also by its excellent use of audio. The characters'

voices are widely varied, and include Southern accents and Scottish brogues. The music bounces energetically in the background, never becoming sappy or boring.

At its core, *Putt Putt* is a questing game in which the player, as Putt Putt, must solve certain puzzles in order to win his or her reward. The puzzles are of reasonable difficulty for the intended age group, and they're all fun to play. They require some problem-solving skills, but each solution suggests the solution to another problem. For example, Putt Putt must find a puppy, so he needs something to lure the dog into his back seat. The place where he finds the bait is a location where he's attempting to solve another puzzle.

Putt Putt's educational value focuses on logic skills, deductive reasoning, counting, problem-solving, and hand-eye coordination. But children will be so engrossed with helping Putt Putt that they'll never once feel like they're being drilled.

Finding a child who won't enjoy playing *Putt Putt* will be tougher than solving the Sunday *New York Times* crossword. The elements of the game cohere to provide a wonderful trip through one of the most pleasant towns you can visit in the educational world of CD-ROM.

— Heidi E. H. Aycock

The Presidents: It All Started with George

DOS
National Geographic Society

This presidential tour-de-force includes an abundance of the best visual material available. Three extensive photo essays — Elections, Presidential Powers, and Presidential Partners — provide background material on the presidency as an office. You can explore

presidents from alphabetical and chronological lists, and you can play a game.

You can learn about every U.S. president from George Washington through George Bush (this disc was developed before the November 1992 election). From here you can launch into a variety of choices to explore the president selected — there's dramatic video footage (for *Commanders in Chief* since the turn of the century), powerful still images, election memorabilia, and intriguing glimpses into their lives and their times.

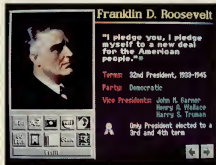


Photo albums for each president offer informative capsules that include important facts and figures as well as details on the more ordinary aspects of his life (children's names, pets, etc.) Also included are short, well-written essays on each president, as well as audio bits of important speeches.

But the backbone of this product is the interactive time line. Divided into the four-year intervals that correspond to the normal tenure in office, the time line places icons representing cultural, historic, scientific, artistic, musical, and literary achievements, as well as important world events.

The point-and-click interface makes it easy to investigate each event independently, and you can get a more expansive view of the flow of U.S. history from 1789-1992 by studying the sequence of events on the time line itself. *The Presidents: It All Started with George* lacks nothing — in fact, it's so well packaged

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that it leaves you wanting more video footage, more audio segments, more essays, more information, and a more powerful search option. But given the space available on a single CD-ROM, National Geographic has done a wonderful job of putting together an introduction and overview of the American presidency.

—Leslie Eiser

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It's a Bird's Life

Mac
Sanctuary Woods

Since her well-earned success with the early '80s television hit "Fairy Tale Theater," actress/producer Shelly Duvall has branched out into a wide variety of creative venues. *It's a Bird's Life*, on the Sanctuary Woods label, is Duvall's first venture into the world of CD-ROM multimedia software.



It's a Bird's Life succeeds as a pleasant blend of whimsical storytelling that manages to entertain and educate at the same time. Colorful original artwork, coupled with Duvall's charming narration and a cheerful musical score by Grammy nominee Dan Gilroy, serve up a refreshingly original package.

The story line is a bit on the thin side, but nobody's expecting *War and Peace* here. A flock of parrots and exotic birds, who flee their Los Angeles home when it burns to the ground, high-tail it south for the Amazon rain forest. They succeed in reaching their destination, but decide to return to L.A. when they discover that man is bulldozing their paradise for a buck. Politically trendy? Perhaps.

The story artwork contains a number of animated point-and-click objects. The most interesting are those that take the story traveler for a brief side-trip into a handful of simple story-related activities, including finding objects within a picture, jigsaw puzzles, coloring, and connect-the-dots. The other objects tend to be rather predictable — toast pops out of a toaster, coconuts fall out of trees, and so on. I would have appreciated a bit of the whimsy found in the animated objects of Broderbund's "Living Book" series.

Using the controls provided on the main screen, one can fly directly to an individual chapter or page, or perch posthaste at any of the story's games or songs. There's also a series of vignettes that give additional background on the story's characters, and an informative reference section with facts about parrots around the world.

My six- and nine-year-old software testers thoroughly enjoyed *It's a Bird's Life*, although they occasionally complained about the time it took to move from one section to another. Even so, this is one flight of fancy most kids won't want to miss.

—Arlan Levitan

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Annabel's Dream

MPC/Mac
Texas Caviar

Imagine a striped cat whose heart's desire is to live in the mystical world of ancient Egypt. Sounds strange? It's not — *Annabel's Dream* is an enchanting and absorbing story about an unusual feline, Annabel, who learns to become a more mature, gracious, and understanding cat.



The story is presented like a simple picture book, with small bites of text and simple drawings. Most of the scenes are rendered in black and white (with several artistic touches that add charm to the characters' personalities), but the program switches to color during Annabel's dream. In accompaniment to the text and pictures, a female voice narrates the story with feeling and warmth. If a child is curious about a word in the narrative, he or she can pause the story and look up the word in a glossary. Here the word is pronounced and a definition is given.

After hearing and reading *Annabel's Dream*, children can explore a number of related activities on the disc. There are anagrams, scenes to color, and suggestions for discussion. The program also recommends a few activities that can be done without the computer.

For older children, or for those who want to learn more, *Annabel's Dream* offers more advanced passages about Egypt, including stories about three very different children who live in the country. It also contains background material on

Verdi's opera, *Aida*, which serves as the underlying musical theme to *Annabel's Dream*.

Adults can benefit from the program, too. *Annabel's Dream* includes a section explaining what children should learn from the story—how to deal with anger, teasing, and sibling rivalry—while another section offers guidelines for successful parenting.

The various sections in *Annabel's Dream*—all attractively presented and well written—seem a bit disjointed, but all of the information here has considerable value. Overall, this disc is highly recommended for the whole family.

—Heidi E. H. Aycock

PilgrimQuest

DOS

Decision Development Corp.

This disc embarks with noble aspirations—like those of the original pilgrims. Co-developed by Decision Development Corporation and the National Geographic Society, *PilgrimQuest* is a well-rounded educational journey that has plenty to offer in the way of solid content. Unfortunately, the product hits some stormy weather in the form of careless execution problems.

The action begins in England, one week before sails are set for North America. Your first duty is to outfit the ship with as many provisions as your limited budget allows. The trip across the Atlantic is almost inconsequential. You can either navigate by yourself or bypass the journey altogether.

On arrival to the New World, you choose one of six pieces of land for your settlement. To make your comparison shopping easier, each site is graded on a variety of survival-oriented factors (i.e.,

access to fresh water, amount of harvestable timber, etc.).

The real work begins when you start building your settlement. Scores of your fellow pilgrims took ill on the ride over, so your work force is limited. Learning to delegate your resources efficiently is the game's key challenge, along with hurdling the program's quirks.

And there definitely are a few oddities about this simulation. For instance, the manual is quite careful in referring to the original inhabitants as Native Americans. Start the game, however, and we're inexplicably back to calling them Indians.

Similarly, the box lists a target age range of 9 to 90, while the accompanying Guide Book seems to position the product as a curriculum tool, with specific application suggestions for grades 5, 8, and 11.

More confusing still is the lack of useful instructions for a number of pilgrim activities, including logging, fishing, and bailing the Mayflower during its ocean voyage. Be prepared to sink a few times while you figure out the quirks of the interface during these game segments.

Granted, these aren't points that



make this disc sink or swim, but they reveal cracks in an otherwise fine program.

One of *PilgrimQuest*'s strengths is its variety. Players are kept busy tending to chores, governing their community, and exploring the local terrain. Children will

learn pilgrim history with this program, while being entertained. There are even arcade-style sequences built around hunting, fishing, and other activities. The mix of video clips and supplemental information is a plus, too, although a greater use of audio would further enhance the product.

I should note that while *PilgrimQuest* isn't the greatest looking game around, it *needs* to be. Compared with the static experience of reading *Pilgrim* history from a textbook, *PilgrimQuest* is a whirlwind visit to an amusement park.

—Phil Powell

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Arthur's Teacher Trouble

MPC/Mac

Broderbund

This animated story-book adventure from Broderbund's Living Books series not only reaches out and grabs beginning readers—it also grabs their brothers, sisters, and even their parents. The story of Arthur's adventures is more than cute—it's playfully enriching, totally charming, and lots of fun.

You start by picking a language (Spanish or English) and the "Read to

Me" option to hear Arthur's story. The delightful voices of Arthur, his teacher, and his friends bring Marc Brown's story to life. At first, you're content just to listen, watching Arthur learn about the frustrations of working hard for a teacher who just

doesn't seem to understand the problems of growing up. As you become more familiar with the text, you discover the joys of the "Let Me Play" mode.

Text alternatives are provided—youngsters can choose to hear each sentence spoken repeatedly, or have the

computer spell out the words on command. In addition, dozens of animations are hidden on each page. Discovering these animations — found in kitchen cabinets, under chairs, and in Arthur's classroom — is not only fun, but also quickly turns the story into an interactive language-learning adventure.

It's not just an adorable story line and an abundance of animated sequences that make *Arthur's Teacher Trouble* special; it's the way Broderbund has used the CD-ROM medium to advantage in combining graphics, sound effects, and speech into a cohesive, entertaining, and educational whole.



The introductory menu, with its choice of languages, play modes, and user options, illustrates the expertise of the designers. While a young user is making up his or her mind, for instance, Arthur doesn't just wait around. He dances to a listening musical selection, eventually blushing when he realizes he has an audience. Every option on every menu leads to additional animated sequences, each unique and all packed with the original humor that's a hallmark of the Living Books series.

Of course, young users won't be looking at *Arthur's Teacher Trouble* as a technological tour-de-force. Instead, as they interact with the story, they'll be inadvertently reinforcing the relationships between written and spoken language. And that's the brilliance of *Arthur*: solid educational content in a program that's so much fun to explore.

— Leslie Eiser



THE ARTS

A Hard Day's Night

The Voyager Company
Mac/MP3

Thirty years ago — yes, really — four lads from Liverpool caught the world's eye with a rock-and-roll band that would forever alter the course of popular music. Shortly after the Beatles' historic first visit to America, they starred in *A Hard Day's Night*, a film that personally introduced the movie-going public to each Beatle. Directed by American-born, London-based Richard Lester, the film also introduced a new visual vocabulary for musical filmmaking, one that still thrives in today's music videos. Now, with Voyager's recently released CD-ROM version, this same film is introducing a new way of watching movies.

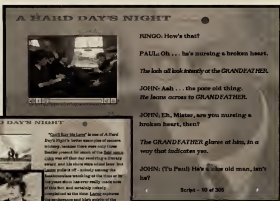
The disc includes the complete feature film, which still sparkles with charm and wit after three decades. But what makes this CD-ROM version unique is the addition of other video clips, text screens, and photos, all documenting the musical and cinematic context in which the movie was created.

Two such features are an extensive commentary by film historian Bruce Eder (in which he describes the production of the film



and the evolution of the rock-and-roll movie) and a copy of Alun Owen's original script. The film evolved as it was being made, and changes are indicated in the script, showing parts of the story that were cut, as well as dialogue and actions that were improvised on the set. (The script is also helpful for deciphering bits of Liverpudlian dialect that might confuse the American ear.) Other text screens contain interesting factoids about the songs in the film and biographical sketches of cast and crew members.

The quick access of CD-ROM encourages random browsing of the movie. There are several ways to find a particular shot, including dragging a slider, selecting from a list of songs or scenes, and flipping to an associated page in the script. *A Hard Day's Night* is generally easy to use, but the interface does have a couple of annoying glitches. The arrows for paging through the script sometimes behave unpredictably, turning the page the wrong way. Also, when using the mouse to skip around in the film, it occasionally jumps back to the beginning for no apparent reason. These problems aren't serious enough to spoil the



program, but they do increase the amount of

time it takes to feel comfortable navigating through it.

The disc is a technical marvel, containing nearly two hours of full-motion video. Although the QuickTime video falls

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well short of videocassette quality, it's acceptable for one person sitting near the monitor. The pictures look smooth and natural in the standard two-by-three-inch window, and the 22 frame-per-second rate avoids the jerky motion often seen in software video clips. The double-sized display window is easier to see if you aren't sitting right at the screen, but it has an unattractive, grainy appearance that isn't present with the smaller size.

Frankly, if you want to lean back in the La-Z-Boy and watch a movie, a videocassette of *A Hard Day's Night* fits the bill better than this disc. But if you'd also like to know the story behind the film, and learn more about the music in it, you'll find that *Voyager's* CD-ROM more than satisfies.

—Tim Victor

I Photograph to Remember Mac The Voyager Company

Ernesto and Liesel Meyer emigrated from Germany to Spain and then to Mexico to escape the persecution of European Jews prior to World War II. With them went their only child, Pedro. Ernesto made his living selling toys and running his own business importing porcelain and other goods from Japan. Pedro became one of Latin America's most prominent photographers, earning a Guggenheim fellowship and placing his work in several major museums. Though Pedro started a family of his own and spent much time traveling around the world, he remained close to his parents. They shared an enduring love, what Pedro called a "complicity of tenderness."

When Pedro Meyer learned that Ernesto and then Liesel were dying of cancer, he decided to record their last months together in a series of photos. It



took him three years to actually develop the film. "I sensed the need to grasp this period in pictures. I needed something to go back to, something that would help me better understand what we were living through." Out of this desire came *I Photograph to Remember*, a most unusual and emotionally affecting CD-ROM title.

This disc combines a simple narrative, observant images, and a timeless, universal story. It contains about 100 black-and-white photographs; some are old family snapshots, but most are by Pedro Meyer himself. Meyer provides the narration in both English and Spanish audio versions, telling with gentle voice of his parents' lives, their love for each other and his for them, their determination not to be beaten by their disease — Ernesto survived three years longer than predicted, outliving some of the doctors who made the prognosis — and their inevitable



surrender to death. A spare piano soundtrack by composer Manuel Rocha and an elegant navigation system provide an uncluttered environment for viewing the photographs and listening to the story.

The result is, as you might expect, not your usual slick multimedia CD-ROM. Viewing *I Photograph to Remember* is an intimate experience, like looking over a family photo album with a close friend. It requires time, patience, and privacy to absorb. Don't be put off by the difficult subject matter: yes, there are pictures of Ernesto and Liesel in pain and in death, but their son's photographs are clear-eyed and affectionate, not exploitative or morbid.

By the end you'll feel that you know and care deeply about these three people. It's difficult to forget Pedro Meyer's final words, spoken over the image of a Mexican kite in the form of a man with wings straining upward: "As I am left with all these images, I remember. I remember how my mother used to ask, 'Why can't we have this closeness, this togetherness all of our lives?'"

—Steven Anzovin

Multimedia Beethoven MPC Microsoft

It sounds like an oxymoron: Beethoven, artist for the ages, meets Multimedia, buzzword for the moment. Regardless, *Multimedia Beethoven* is a superbly executed and memorable disc likely to convert even the most staunch multimedia disbelievers. These disbelievers might be culture buffs who don't see what computers have to do with anything, or teachers still wondering if computers can truly educate. Whoever they are, they're going to be impressed. It's guaranteed.

Besides the full recording of the composer's Ninth Symphony, *Multimedia Beethoven* includes separate "courses" on

Beethoven's life, classical music, and the famous symphony itself. A premise of this title is that the Ninth Symphony, like many famous works of art, is familiar to most of us, but known well by only a few. And since most of us will not be taking any courses in music history, *Multimedia Beethoven* helps to educate and enlighten.

The program begins by showing a graphic of an orchestra as the symphony's famous Joy theme plays. One click away is the main menu, which contains five entry points leading to all of the various



components and levels on the disc. Every area is worth exploring, but the full educational potential is most clearly apparent in two sections: "A Close Reading" and "The Classical Orchestra."

"A Close Reading" plays the entire symphony. While you're listening, you see the notation for the section being played. Most importantly, though, the left side of the screen displays a running commentary, explaining in detail what's going on in the music. At any point, you can pause the music, step ahead one page, one section, or even an entire movement. Or, if you find something you'd like to explore, you can move temporarily out of Close Reading to a different branch in the program.

At many points during the commentary in "A Close Reading," a term appears in bold face. By clicking on the word or phrase, you move either into a glossary or into a more detailed definition screen. Each glossary item offers a concise definition, and some trigger the playing of a musical

example from the symphony or from a separate music file. The definition screens display several bars from the score, and offer you the opportunity to hear them played. It helps, of course, to know some basics about musical notation, but because the program highlights the notes being played, it's not necessary. Whether you're a complete beginner, someone who once took a few years of piano lessons, or a fairly accomplished student of music, "A Close Reading" and its associated help screens will teach you a great deal.

"The Art of Listening" lets you explore a wide number of musical ideas and concepts concerning classical music and the Ninth Symphony. All screens are well presented and easy to read, and many of these include options for listening to examples. The screen dealing with the term "conflict," for instance, offers examples from Movements 1 and 4 of the Ninth, while the screen explaining the difference between "melody" and "harmony" lets you hear the Joy theme as either pure melody or as a small section complete with harmony. "The Classical Orchestra" section offers a wealth of information about the instruments and how they're arranged, and you can hear examples of most of the instruments from the recording itself. Also available is the entire text of Schiller's "Ode to Joy" (the lyrics of which inspired part of the symphony), including English translations of the chorus singing in German.

There's a great deal more to this program, including a game to test what you've learned. The important point, though, is that *Multimedia Beethoven* does exactly what multimedia as a concept has always promised. If you haven't picked this title up yet, don't hesitate.

— Neil Randall

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Last Chance To See

Mac
The Voyager Company

Last Chance to See chronicles the travels of Douglas Adams (author of the *Hitch Hiker's Guide to the Galaxy* books) and zoologist Mark Carwardine. Together they search for the last surviving members of some rare and endangered beasts, including the Komodo dragon, the mountain gorilla, and the Yangtze River dolphin.



They are mean eaters. That is not so bad in itself. Lions and tigers are mean eaters, and though we may be intensely wary of them and treat them with respectful fear we nevertheless have an instinctive admiration for them. We don't actually like to be eaten by them, but we don't resent the very idea.

This CD-ROM travelogue is truly exotic, with stops in China, Indonesia, New Zealand, Madagascar, Mauritius, and Zaire, among other places. Even better, it examines a fascinating question with moral implications: Should we expend great amounts of time, money, and effort to preserve rare species that will otherwise soon be extinct? Adams comes down firmly on the side of preservation, though he recognizes the impossibility of complete success. Carwardine has the last and best word on the subject: "There is one last reason for caring, and I believe that no other is necessary. The world would be a poorer, darker, lonelier place without them."

Last Chance to See is not a "nature show" in the usual sense (though sympathetic viewers will get the same jolt of "extinction guilt" as from a typical episode of *Nature* or a National Geographic special). Even Adams begins the adventure by remarking, "This isn't at all what I expected." Readers of the hilarious *Hitch*

Hiker books will know what to expect, however, though nature-lovers hoping to see a complete lineup of endangered beasts may be disappointed.

Adams spends as much (or more) time satirizing the cultural foibles of the lands he visits as he does actually viewing vanishing species. But this merely reflects the fact that every endangered habitat is no more than an island in a thoroughly humanized world. True, you'll learn more than you ever wanted to know about the absurd difficulties of reserving a seat on a

plane leaving Bali or securing a boat ride up the Yangtze, but there are also many priceless moments of interspecies humor. In the "Here Be Chickens" section, Adams bypasses what appears to be a stuffed dragon at Komodo Island's tacky visitors' center, only to be scared out of his wits when the supposedly inert varanid steals his lunch (a live chicken) and runs into the bush.

There are six hours of wry-voiced audio narration by Adams in this double-disc set, as well as 800 striking color photos and excerpts from a BBC radio series based on the same material. Clicking on each picture blows it up to full-screen size, and hyperlinks take you to sidebars that highlight the narrative. The sidebars include comments by Carwardine and an interview with evolutionist Roger Dawkins. Text- and picture-search tools and a simple bookmark system make it easy to find your way around and take up where you left off—and a good thing too, since *Last Chance to See* is one CD-ROM you will not exhaust in one or two sittings.

—Steven Anzovin

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APPLICATIONS



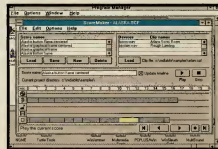
MediaBlitz! 2.0

MPC
Asymmetric

Given the wide variety of file types supported by the multimedia environment of Windows 3.1, developing mixed-media presentations under Windows can tax the file-management abilities of even the most experienced power user.

Asymmetric's *MediaBlitz!* consists of three Windows applications that are plain in appearance but rich in function. *MediaBlitz!* gives builders of Windows-based multimedia presentations a convenient way to organize related visual and aural elements, choreograph their on-screen undulations, and export all the files required to play back the finished product. The latest release, version 2.0, adds full support for Video for Windows and Object Linking and Embedding (OLE).

MediaBlitz!'s ClipMaker application lets you build libraries of related file clips. For example, all of the sound, video, and graphics files related to "Arlan Airlines" could be grouped together in a Clip file, along with descriptive entries for each. Since the Clip file is primarily just a list of the associated files, they can reside in different directories, but can be referenced as a group. This makes it a snap to keep the original files organized by file type. ClipMaker supports Windows wave





audio (.WAV), MIDI (.MID), Video For Windows (.AVI), Windows Bit Map graphics (.BMP), direct playback of CD audio, and animations created by AutoDesk's *Animator*, Macromedia's *Director*, and Gold Disk's *Animation Works*. Clipmaker's editing controls let you fine tune both the beginning and end point of sound and video tools.

Once the media clips are organized into *MediaBlitz!* clips, they can be loaded into the *ScoreMaker* application. Using a multitrack graphic time line, *ScoreMaker* allows elements selected from clips to be built up into a full-blown presentation. The time and order of appearance, screen position, and blend of different types of elements are arranged and modified by simply moving blocks that represent each element along the time line. A single score may reference multiple clip files. Since the score files are, like clip files, simply lists rather than the original source files, there's no wasted space and no need to move extra copies of files around.

The *ScorePlayer* application serves several useful functions. First, it allows you to build a list of Score, Clip, and source files to be played. Once the play order has been determined, *ScorePlayer* can move copies of all the files required for playback of the complete "show," consisting of one or more scores, into a single target directory. Once all the requisite files are in place, it's a simple matter to migrate the complete show to

whatever media you chose.

ScorePlayer acts as the distributable playback engine for *MediaBlitz!*-produced shows and lets the user insert a show directly into Windows applications that support OLE. Asymetrix includes the info required for programs written in C to call and play back *MediaBlitz!* shows.

Although *MediaBlitz!* can be set up from the supplied 3.5-inch diskettes, installing from the included CD-ROM is far more convenient. In either case, you'll need at least 14 megabytes of free space to get *MediaBlitz!* loaded successfully. The CD-ROM also includes a wide selection of sound, graphics, MIDI, and video source files that can be used as the first building blocks of a multimedia resource library. There's also a utility for Kodak Photo CD-compatible drives that translates the Photo CD images into Windows bitmap map files.

MediaBlitz! has special software "hooks" that work hand-in-hand with Asymetrix's companion *Multimedia Tool Kit* product. Installing *MediaBlitz!* on a system already equipped with *Tool Kit* adds a special "Media Links" menu to *Tool Kit* that allows *MediaBlitz!* shows, scores, or clips to be directly linked to objects. The two packages working together form a powerful pair — so much so that both are supplied as the standard multimedia authoring software with Creative Lab's popular *VideoSpigot* for Windows video capture board.

MediaBlitz! 2.0 is not targeted for the general consumer market, but it's likely to make the "must-have" list of those who want to create multimedia presentations under Windows with a minimum of fuss.

—Arlan Levitan

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The Microsoft Office for Windows

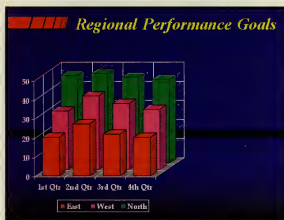
MPC
Microsoft

One of the lingering reservations about CD-ROM technology is that it has only limited use for business applications. And, admittedly, for the tens of thousands of XT and AT machines running character-based versions of *WordPerfect* and *Lotus 1-2-3*, the argument holds now and will continue to do so. But with Windows-based PCs and Macs capturing larger shares of the corporate market, that same argument must surely be in for a challenge. What CD-ROM needs is a "killer app," the kind of program that will do for CD-ROM what 1-2-3 did for the IBM-PC market. A program, in other words, that will make businesses buy the hardware to run it.

The Microsoft Office for Windows isn't the killer app we're looking for. It is, however, a good start. What *Office* does is to bundle three of Microsoft's most successful business packages onto one CD-ROM, thereby taking the guesswork out of figuring out which combination to buy. *Word for Windows 2.0c*, *Excel 4.0*, and *PowerPoint 3.0* are among the top applications in their respective categories, so anyone buying the CD-ROM collection already knows that they're getting some of the best.

We'll focus on the difference between the floppy-disk and CD-ROM versions of this collection. First, though, for those who may not be familiar with them, a brief note on the individual packages is in order.

Word for Windows is among the top three word processors for Windows, and feature-by-feature, continually battles it out with *Ami Pro* (now at version 3.0) and *WordPerfect for Windows* (currently at 5.2, with 6.0 around the corner). *Word for*



Windows is extremely strong in areas such as long documents and full Windows compatibility, and it offers the best macro language of the bunch. It's also the only one of the three that runs well on a 286 or 386SX.

Excel was the first spreadsheet for Windows, and in its fourth major revision it is unquestionably the current leader in the category. Borland's recently released *Quattro Pro for Windows* is exceptionally strong, but has general sluggishness problems. *Lotus 1-2-3 for Windows* lags behind both, although version 2.0, due this summer, has a great deal of promise. But *Excel* is the leader, and there's no reason it shouldn't remain so.

PowerPoint is Microsoft's package for designing and producing business presentations. Now in version 3.0, it has pretty well kept pace in a crowded field, but in several ways lags behind such

packages as *Harvard Graphics for Windows* and *Lotus Freelance Graphics for Windows*. Still, with such strong competition in this category, being third or fourth is a little like getting the bronze medal in the Olympics. *PowerPoint* is the weakest application in *Office*, but it's still a very fine program.

The versions of these applications on CD-ROM are identical to their disk-based counterparts, with one major exception. When you buy the disk versions, you receive several user manuals. With the CD-ROM version, you get no printed documentation. Instead, all the manuals are stored on the disc itself, and you can access them either through the

help menus of the individual programs (except, oddly, for *PowerPoint*) or by clicking on the *Microsoft Office* icon that the setup program installs. The benefits of having the manuals on the disc are many: they're more readily accessible, topics are linked hypertextually (you click from one to another rather than turn pages, and cross-references are listed), and, in these green-conscious days, they don't use paper. The disadvantage is that CD-ROM access isn't particularly fast, a point particularly applicable to *Word*, which uses the CD-ROM for its entire help system. Help for *Excel* and *PowerPoint* is in files you save to your hard drive during installation.

The CD-ROM offers two other significant advantages. First, installation is far easier because there's no disk-swapping session. From start to finish, the entire package installs in about 20

minutes, and once it starts you can leave the room. Second, the CD-ROM version saves space on your hard drive. Each of the packages offers a CD-ROM installation option, which lets you place only the most important files on the hard drive, accessing the rest from the CD-ROM. The difference is crucial if you're short on hard-disk space: a full install uses about 35 megabytes, while the CD-ROM install reduces this to about 15.

Office lists for \$795, but street prices are between \$400 and \$500. Purchased separately, the applications would cost considerably more. There's a case to be made, though, that the CD-ROM version should cost even less, especially since the publisher saves printing costs. Hopefully, Microsoft and others will address this point in the future. For now, though, *Office* makes good sense for business: one disc, no manuals, a solid suite of programs, and a cost savings.

— Neil Randall

• • • • •

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Kodak's Photo CD Portfolio: The New Family Album?

Family photo albums have changed remarkably little in nearly a century. Today's albums might have plastic "magnetic" pages instead of heavy black paper, but we still arrange simple layouts of snapshots to make treasured albums that are passed around at family gatherings.

Nothing wrong with that. Traditional albums are portable and affordable. But Kodak — whose original box camera introduced photography to the masses in the 1880s — now thinks it's time to pull consumers toward the twenty-first century. Kodak's Photo CD, launched last year, lets you transfer 35mm negatives or slides onto special CD-ROMs. With a Photo CD-compatible disc player, you can display your pictures on a TV. If you have a compatible CD-ROM drive, you can load the pictures into a personal computer, where all kinds of manipulation is possible without a messy darkroom.

Although Photo CD has been available for more than a year, many people are only vaguely aware of its possibilities. One reason is that Kodak is aiming Photo CD at two very different groups: everyday snapshooters and publishing professionals. The professionals are paying serious attention, because Photo CD neatly bridges the worlds of conventional photography and digital imaging.

But ordinary folks are still confused, and now Kodak is bombarding the market with a whole range of Photo CD spinoffs. There's Photo CD Master (actually the original format, renamed); Pro Photo CD Master (for professionals who need to store negatives or slides larger than 35mm); Photo CD Catalog (to support Kodak's futuristic vision of mail-order catalogs on CD-ROM); Photo CD Medical (so doctors can archive their X-rays and CAT scans); and, for consumers, Photo CD Portfolio.

Portfolio is yet another new twist on the family album. With Portfolio, you can make your own multimedia albums that mix pictures, sound, and text with *interactive branching*.

Interactive branching means you can view the pictures in any order by selecting from on-screen menus. For

instance, let's say you make a Portfolio disc of your family tree. Each family member could be represented with a picture, a voice recording, and some text listing the person's name, birthplace, and so on. Then you could interactively climb the tree, tracing your ancestors through any bloodline.

You can do this with regular Photo CD, too, except a disc holds only 100 images. Portfolio discs can store up to 800 images or 60 minutes of sound, or any proportional combination (e.g., 400 pictures and 30 minutes of sound).

Portfolio lets you make your own multimedia albums, mixing pictures, sound, and text.

That's because Portfolio images are stored at a lower resolution, although they're still plenty sharp for TVs and computer monitors.

When Portfolio debuts later this year, Kodak will offer two ways to create multimedia albums. Most people will bring their pictures, tape recordings, and other materials to a store that's equipped with a special computer workstation. By using Kodak's authoring software, you'll assemble all the parts into a finished sequence, which is then copied onto a Portfolio disc. The disc plays on any compatible Photo CD player or CD-ROM drive.

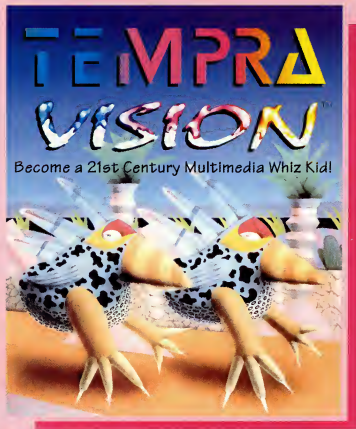
The second way to make Portfolio CDs is used mainly for businesses creating multimedia presentations. Kodak will introduce a recorder that lets personal computer users make their own Portfolio discs. Eventually this technology may reach the consumer market, but for now it's expected to cost at least \$6,000.

Kodak is also trying to get publishers to sell pre-recorded titles on Portfolio CDs. Some obvious possibilities are children's stories and guided tours of famous museums.

Not everyone is convinced that Portfolio will be a hit with consumers. It's not cheap, and some people are now using camcorders instead of still cameras to record family events. But there's no doubt that the TV has become the focal point of family entertainment — and not just for watching broadcasts. Over the next decade, we'll see increasing competition to use the TV as the central platform for other forms of home entertainment.



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